The RUBBER AGE

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Late News of the Rubber Industry

Two Countries Abandon Restriction

IT IS interesting to note that two attempts of governmental control of commodities in the world market are being abandoned almost simultaneously. Early in the current year the British Government announced that, as of November 1, the Stevenson scheme for the restriction of crude rubber exports from British Malaya and Ceylon would cease and only recently the President of Cuba has issued a statement that there will be no further restriction on the sugar crop which is now maturing.

Cuba's plan has been in force only since 1926 while the Stevenson Act has been in force since the latter part of 1922. It is apparent, however, that the planters in both areas have reached the same conclusion as to the efficacy of the principle of restriction and have learned that such schemes can easily develop into boomerangs by benefitting their competitors at the expense of themselves. Both groups have not found any substantial advantages in restriction and now feel that their interests can be served best by facing and meeting, without governmental support, such competition as develops.

New Stock Issues Are to be Offered

IT IS understood that the directors of the Goodyear Tire & Rubber Company have approved plans for the expansion of the company's manufacturing facilities through the sale of additional common stock. The company expects in this manner to secure about $10,000,000 for improvements. During the last fortnight, the Kelly-Springfield Tire Company has also shown signs of expanding, through the announcement of a refinancing plan, whereby 700,000 additional shares of common stock have been authorized. While in the latter case the new funds will be used largely to retire outstanding indebtedness, it is understood that some part of them will be used for new equipment and increasing production facilities.

American Investments in Foreign Rubber Projects

THE Department of Commerce has recently completed an exhaustive study of the investments of American capital abroad in the form of foreign corporate securities. It placed the total American interest at the end of 1927 at the enormous sum of $11,659,383,529. While it is natural that public utilities, railways, mining, oil and banking should be the types of investments most prominent, it is interesting to note that in a schedule of the par value of foreign corporate securities by types of industry publicly offered in the United States from January 1, 1914, to January 1, 1928, the American interest in rubber investments ranks eighteenth with a total of $13,800,000.

This total does not include the investment of American capital into purely American rubber plantation projects which has been recently estimated at an additional $44,618,877. The aggregate of these two figures represents a formidable interest in crude rubber production.

Goodyear-Zeppelin Corp. Secures Dirigible Contract

SECRETARY of the Navy Wilbur has at last announced definitely that the contract for the construction of the two 6,500,000 cubic feet volume dirigibles will be awarded the Goodyear-Zeppelin Corporation, at Akron, O.

Of the twelve designs and bids opened on August 10, only those of the Goodyear company and the American Brown-Boveri Corporation, of Camden, N. J., met the specifications for construction. The Goodyear bid was for a total of $7,950,000, while the other concern bid $9,000,000. The latter was in excess of the Congressional appropriation of $8,000,000.

The plans for the new ships will be along the lines submitted by the Goodyear-Zeppelin Corporation over a year and a half ago and which were awarded a Congressional prize at that time of $50,000. The actual signing of the contracts will mark the end of a four years' effort on the part of the Goodyear company to secure this business.

Fulton Field, outside of Akron, has been selected as the location of the proposed hangars for the construction of the new dirigibles. Preliminary work on the ships will begin at once.

The Grand Old Man of the Rubber Industry Passes

WITH the passing of Sir Henry Wickham, the rubber industry not only loses one of the most prominent characters in rubber history but a man who embodied the finest type of scientists and naturalists of the old school. His early work in the heart of Brazil called for courage and that degree of persistent effort against hardships and conditions which has so characterized the leaders in pioneer botanical research.

Full recognition for his services to the rubber plantation industry was long delayed and it has only been in the last

few years that he has enjoyed the honor and emoluments which he so long deserved.

His death in London on September 27 at the age of 82 will be mourned by the rubber manufacturing industry as well as in plantation and rubber trading circles. His record of achievement and worth to the industry as a whole deserves greater space than can be given in these short news brevities. A more complete tribute to him is carried on page 25 of this issue.

Fisk Elects Espenhain Executive Vice-President

THE election of Frank K. Espenhain as executive vice-president of the Fisk Rubber Company was announced on September 29. Mr. Espenhain was until recently first vice president of the Goodyear Tire & Rubber Company.

As head of his own business in St. Louis and Milwaukee and later in export work in New York, Mr. Espenhain received the training that led the United States War Department to put him in charge of securing warehouse space for the innumerable materials needed for the use of the A. E. F. in France. While all industry was mobilized for the war, it was the duty of Colonel Espenhain to find space to store this tremendous production and have it ready for shipment.

Mr. Espenhain became associated with the Goodyear organization in 1921 as export manager and was subsequently given the duties of assistant to the president, and vice-president of the company.

New President of India Rubber Company Takes Office

W. G. Klauss, newly elected president of the India Tire & Rubber Company, Mogadore, O., has assumed the duties of his new office and is planning an intensive sales campaign to give India tires the widest possible distribution. Mr. Klauss is also president of the Federal Match Company of Chicago.

Several years ago, Mr. Klauss was in charge of the southwestern section of the country for the Johns-Manville Company with headquarters in St. Louis. He was then called to New York to become assistant to T. F. Manville, chairman of the board and operating head of the firm. It is reported that a plan had been arranged to sell a minority interest to a prominent New York banking house and to make Mr. Klauss president of the company, but that deal failed because of the death in 1925 of T. F. Manville. It was a short time later that Mr. Klauss resigned to become associated with the Federal Match Company.

One of his first statements as head of the India organization has been to deny the rumors that financial interests in Chicago were behind plans to provide new capital for the company, similar to the $800,000 bond issue which the Union Trust Company recently underwrote for the Mohawk Rubber Company. "Just now," Mr. Klauss says, "India is not seeking additional financing."

McCorkle is Named As Miller's Sales Manager

R. A. McCorkle, who has been connected with the Goodyear Tire & Rubber Company for the last 15 years in several important positions, has been appointed manager of the manufacturers' sales department of the Miller Rubber Company in place of F. C. Millhoff who recently resigned.

As assistant of Goodyear's manufacturers' sales, Mr. McCorkle gained an extensive acquaintance in car and truck manufacturers' circles and is regarded as an authority in that department of the rubber business. He will make his headquarters at the Miller office at Akron, but will take charge of all manufacturers' work both in Akron and Detroit.

Mr. McCorkle will be assisted by C. H. Russell, formerly in charge of truck tire sales at Akron, who will make his residence in Detroit. A. L. Bowman will succeed Russell as manager of the truck and bus tire department at Akron.

Rubber Section of Safety Congress Holds Annual Sessions

THE Seventeenth Annual Congress of the National Safety Council, held in New York City from October 1 to 5, was well attended by members of the Rubber Section of the Council and representatives of the safety departments of practically every one of the larger rubber manufacturers. The program of the rubber section, which occupied three days, began with a luncheon on Monday, October 1, after which R. G. Knutson, a member of the Industrial Commission of Wisconsin, spoke on "Safety Moves and Why." Later the section held a round table discussion.

All meetings of the Rubber Section were held on the mezzanine floor of the Hotel McAlpin and as the hotel was more or less the headquarters of the Section, most of the rubber men from out of town made it also their headquarters.

The session on Tuesday, October 2, was opened by an address and report by the chairman of the section, R. C. Salisbury, of the Federal Division of the Fisk Rubber Company, Cudahy, Wis., in which he reviewed the work of the Section during the last year. This was followed by a paper by G. W. Cook, supervising engineer of the Travelers Insurance Company, Hartford, Conn., on "Safety in Design and Use of Vulcanizers." F. J. Moxie, of the Associated Factory Mutual Fire Insurance Company, Phenix, R. I., spoke on "Static Electricity in the Rubber Industry," and W. S. Smith, manager of the Safety Division of the Milwaukee Association of Commerce, ended the session with a talk on the "Ramifications of Safety Interest."

After a short business session on Wednesday morning, at which reports of committees were received and nominations for the Section's officers were made for the ensuing year, L. H. D. Healy, technical superintendent of the Federal Division of the Fisk Rubber Company, Cudahy, Wis., spoke on "Health Hazards in the Rubber Industry," in connection with the use of organic accelerators and anti-oxidants. This paper is published elsewhere in this issue of THE RUBBER AGE. The session was also addressed by S. P. Thatcher, of the United States Rubber Company, Detroit, Mich., and by C. L. Hungerford, of the division of safety and hygiene of the Firestone Tire & Rubber Company, Akron, who spoke on the subject of "Safety Kinks," illustrating his talk with many charts and pictures of proposed safety procedure in connection with every day work in rubber factories. The sessions closed with a general round table discussion.

New officers of the Rubber Section, elected for the ensuing year include M. A. Quirk, of the Morgan and Wright Plant, United States Rubber Company, Detroit, as chairman. E. R. Lawler, of the Hartford Rubber Works, of the United States Rubber Company, previously secretary of the Section, becomes vice-chairman and Stanley Mansfield, of the Goodyear Tire & Rubber succeeds his as secretary. John Lynch, of the Fisk Rubber Company, was named as editor of the news letter of the Section. R. C. Salisbury, former chairman, was appointed to serve on the advisory committee.

A Section of the Large Plantation Holdings of the United States Rubber Company in Sumatra

Rubber Plantation Valuation

(This paper has been developed from a thesis submitted by Frank L. Tobey in partial fulfillment of the requirements for the degree of Master of Science in Forestry in the University of Michigan, June, 1928.)

By D. M. MATTHEWS
Professor of Forest Management, University of Michigan

AS a consuming nation America has always been vitally interested in the landed cost of crude rubber but interest has rarely extended beyond this point. When the cost of our supplies has been low we have been content to assume that there has been a decent profit to the producer and when the cost has been high we have declaimed loudly against profiteering and cast envious eyes at the producer's properties but have never endeavored to ascertain definitely what it would cost us to get into the business ourselves and so at least partially protect ourselves in the matter of continuing supplies at reasonable prices. When crude rubber is selling at around 20 cents per pound there appears to be no reason why we should wish to produce and when it is selling at better than 40 cents producing properties are held at values which we consider unreasonable. As long as we continue to reason in this vicious circle we are likely to remain in the dependent position of a consuming nation and, although this position seems an eminently satisfactory one at the present time, we cannot reasonably expect much consideration from producers if and when the position of supply and demand again reverse themselves.

Purchasing Established Plantations

One of the most logical methods for American capital to enter the rubber producing industry is to take over established plantations in districts where the political and economic conditions permit of expansion and make use of the experienced plantation organization on the ground to extend the present development. Now is the time to do this economically. It will always be too late to act if we wait until a shortage of supply and attendant high prices again focus our attention on the producing industry.

But although the present low price of crude rubber has been reflected in lower holding prices for estates it does not follow that wholesale acquisition of properties at price levels considerably below figures asked a few years, or even months, ago would constitute a wise investment program. Whether or not American capital seeks investment in this field the rubber producing industry is on its way to a more stabilized and competitive basis. Financial standards and plantation practices are coming in for very careful scrutiny. Poorly located and badly managed plantations will go out of business and suitable rubber lands and efficient labor and management will be at a premium. Future investment in the industry demands reliable information on the present value of rubber properties and their ability to maintain profits as prices become more stabilized in line with efficient production costs. Such information is not easily obtained for individual producing estates. Generalizations as to cost values are often quoted and may be reasonably accurate for the average of a large number of estates but at best they are only averages of book values and therefore often very misleading. To the prospective purchaser or investor a book cost value can only be considered as an indication of what he might be able to duplicate a property for. It is rarely, if ever, the value at which the owner would sell or at which the investor could, or would, expect to buy. A prospective purchaser should, and generally does, value a property on its income producing capacity. Future as well as present incomes have to be taken into account but past costs have little to do with present values except possibly from the sellers standpoint. Inasmuch as present values of producing properties should be a reflection of future revenues and their duration, the appraisal of such values is not a simple adding up of figures but must take into consideration compound interest and discount. In spite of the fact that the industry is one which is characterized by deferred returns, the compound interest factor appears to have been generally disregarded when placing values upon producing properties or upon virgin land destined for rubber cultivation. It cannot be safely so disregarded; and the thesis upon which this discussion is based was prepared during a study of the problems which arise when applying the principles of compound interest to the rather unusual cost and revenue features which the plantation rubber industry presents.

If rubber were a strictly annual crop the compound in-

terest factor would not apply any more than it does in ordinary farming. If it were similar to a forest crop with a single final yield, or periodic yield, supplemented by incomes from thinnings at more or less definite periods, the application of the usual principles of forest valuation would apply. Unfortunately rubber is neither definitely an annual or a periodic crop but is unique in that there is no income for a period of years; then a period of partial incomes increasing to full production and, lastly, an extended period of full production with more or less equal annual incomes at any fixed price of rubber. The problem which faces the appraiser is to correctly value a property at any time during any one of these periods using, of course, some one fixed value for the price of the product. The aim of the study was to develop a simple method of introducing the compound interest factor into the calculation as otherwise long and complicated arithmetical computations would be required.

Compound Interest as a Factor

It is apparent that during the period of no income, which extends generally from the time opening operations are started until the fifth year, the capital account of any rubber estate must be steadily increasing, and furthermore, must be increasing at compound interest. Moreover, in the second period when production commences such revenues as are obtained are in the first instance very small, not sufficient perhaps even to pay interest charges on the capital which has accumulated by the time revenue first appears. Finally the estate comes into full production and from then on more or less equal revenues can be expected, which can be applied either to the retirement of capital or the declaration of dividends. In ordinary accounting practice compound interest on capital sums which are laid out during the period intervening between initiation of opening operations and first partial incomes is not shown and the capital of the estate appears on the books merely as the sum total of moneys laid out without any interest charge whatever. This is correct enough accounting but is not good valuation either from an owner's or a buyer's standpoint. There are two periods during the life of an estate when the total capital represented by it might be assessed; one, approximately at the end of the fifth year when first revenues begin to accrue, and the other at the time the property comes into full bearing, usually sometime between the tenth and fourteenth year. However, if capital is calculated at the beginning of the period of partial incomes, such revenue as accrues between that period and the time the plantation comes into full bearing would probably not be sufficient to initiate dividends which would not impair the capital represented by the original investment plus compound interest. It was, therefore, decided to fix the capitalization of any estate at the time of full production and to use such revenues as appear prior to this time to reduce that part of the capital represented by accrued interest and then to depreciate the residual capital, from the time incomes become stabilized during the balance of the estimated life of the planting.

As has been stated, the first returns from a plantation usually occur in the fifth year, by which time the gross capital investment exceeds actual expenditure by the compound interest charge. The first revenues received must, therefore, be applied to the reduction of this interest charge and are handled as partial payments toward retiring accrued interest. That is to say, the investor at this time might receive a cash return, but at first this would usually be smaller than interest which is accumulating on the capital during the year in which a dividend was paid. These annual payments or dividends would increase with the yields, finally becoming larger than the interest charge of the current year and the surplus would, therefore, be applicable to the reduction of the previously accumulated interest charge. This system of reducing capital investment is continued until the estate reaches full bearing, when the books are balanced and the remaining accumulated capital is considered as a fixed capital charge subject to depreciation in the usual manner during the life of the estate. It does not matter whether the revenues which accrue during this period are paid out in the form of dividends or reinvested in the property so long as the principle of considering these payments as a reduction of the accrued interest charge is adhered to.

The decision to balance the books at this time was made because it was soon apparent that what might be termed the critical point during the life of the plantation was at the beginning of the full production period. At this point the trees are yielding at full capacity and therefore expected incomes, with stable rubber prices, become more or less equal, and can now be expressed for a period of years as a percentage return on the fixed capital investment. It is also at this point that the influence of excessive expenditures during the opening period become most apparent. The higher the opening charges, the greater the fixed capital investment and the smaller the percentage return on this capital charge, and therefore, the less attractive the enterprise to capital seeking investment.

Basis for Future Returns

This amount of money that necessarily remains in a plantation at the beginning of the period of full production is the basis on which future returns and values must be computed. For convenience, this sum has been termed the "residual capital." Expressed simply, the residual capital value of any going rubber estate in the year in which incomes become stabilized, hereinafter referred to as the year "i," is the sum of the capital expenditures made in the opening and succeeding years carried forward at compound interest from the years in which such expenditures have been made to the year "i," less such revenue as has accrued also prolonged at compound interest to the year "i." The purpose of calculating this so-called residual capital is to make possible the use of compound interest formulae based on equal revenues for a period of years. It is hereinafter referred to in the formulae as "C" and can be mathematically expressed as follows:

$$C = 0^0(1.0P^i) + 0^1(1.0P^{i-1}) + 0^2(1.0P^{i-2}) \ldots \text{etc.} - [Yr^a(1.0P^{i-a}) + Yr^b(1.0P^{i-b}) \ldots + Yr^i.]$$

Where:

- 0^0 is the opening expense incurred the year development starts.
- 0^1 is expenses incurred the following year.
- 0^2 is expenses incurred the following year.
- Yr^a is the net income from light tapping at the age of a.
- Yr^b is the net income from light tapping at the age of b.
- Yr^i is the net income in the year i which brings the plantation to the period of full bearing, and
- P. is the rate of interest charged in the computation, usually approximating the value of money in the locality in which the development is to take place.

The above formula is the foundation of the computation of all values for a full bearing plantation and can also be used for computing the cost value of plantations which have not reached full bearing. It is the basic formula to be used in the valuation of any estate and may be used as a measure of efficient management and practice when applied to a number of similar estates using actual costs. As has been explained above, in actual practice revenues as they appear are immediately used to retire the interest charge. However, the above formula for the purpose of simplifying the calculation carries these revenues forward at compound interest to the year in which incomes become stabilized, when they are deducted in a single sum from the total of the capital expenditure carried to the same date

at compound interest. The resulting residual capital "C" as obtained by the formula is the same as that obtained in actual practice when books are balanced at the time the estate comes into full bearing.

The above formula is, of course, merely a cost value formula but it gives the correct financial position of any property from the cost standpoint at any time up to the year of full production with compound interest allowed for.

Income Value of a Plantation

The income value of a rubber property, which is the value in which a prospective purchaser is most interested, falls naturally into two parts, first, the productive power of the bare land to produce continuing crops of rubber forever and, second, the present value of such future crops as can be expected from the present stand of rubber trees. The income value or "expectation value" of the bare land for the purpose of producing rubber, referred to in the following formula as "RE," is the end value of all equal revenues which can be expected from one planting carried at compound interest for the interval between the year "i," in which they are first obtained, and the year "n" which is the estimated life of the planting, less the residual capital "C" prolonged at compound interest for the same period and the difference of these two sums considered as a series of payments coming every "n" years forever (where "n" is the estimated life of a planting) discounted at "p" percent, first payment due in "n" years:

Expressed in a formula:

$$RE = \frac{\dfrac{Yr\ (1.0p^{n-i} - 1)}{1.0p - 1} - C(1.0p^{n-i})}{1.0p^{n} - 1}$$

Where:

RE is the value of the bare land to produce rubber continuously and pay p percent on the investment.
Yr is the annual net income while the estate is in full bearing.
n is the estimated life of one planting.
C is the residual capital, and
p is the interest rate which is expected or demanded.

The above formula appears complicated but is simple enough in use. Assume we have a property from which we can expect an annual production of 600 pounds when in full bearing, an estimated life of one planting of 40 years and 13 years to come to full bearing. Further assume a net profit per pound of 8 cents, that reasonable efficiency in management will result in a residual capital of $293 per acre and that 8% is expected on the investment. Then substituting in the formula we have:

$$RE = \frac{\dfrac{(600 \times 8¢)\ (1.08^{40-13} - 1)}{1.08 - 1} - \$293\ (1.08^{40-13})}{1.08^{40} - 1}$$ or

$$RE = \frac{\dfrac{\$48.00\ (6.988)}{.08} - \$293\ (7.988)}{20.73} = \frac{\$1852.35}{20.73} = \$89.35$$

which is to say that the maximum value of bare land for the production of rubber with the assumed efficiency in management and with the yield and price as assumed would be $89.35 per acre and such an investment in the land would pay 8% annually. Obviously the above is no more than a measure of the upset price which could be paid for the land and the purchaser would expect to pay less as he estimated the risk involved.

The criticism of this formula is that it is based entirely on values realizable over a long period of years and therefore subject to change. While this criticism is sound it should be remembered that yield per acre, and efficiency in management as represented by the amount of the residual capital, are the governing factors and the formula operates to place a higher value on land from which higher yields can be obtained and where the residual capital is low. Consequently price fluctuations in the value of crude rubber do not decrease the value of the formula which is useful in that it serves to compare values for different properties.

Proceeding now to the consideration of the value of a producing estate. Let us assume that we have already figured the value of "RE" using figures which we consider average and possible for the district. We are not, then, concerned in the actual book cost value of the estate. We are concerned with the capacity of the present stand of rubber to produce future revenues and the number of years these will continue. The probable annual revenue can be fairly accurately determined from past records but the future life of the estate will be open to question. The age and condition of the trees and the buyer's experience will have to be his guides in this matter. With this point decided, the value of the property can be said to be the sum or end value of all expected net revenues from the present planting compounded at "p" percent to the end of its life or say for "n"—"m" years (where "n" is the expected life and "m" is the present age of the estate) and discounted for the same period with the first payment to come one year from the date of the calculation, plus the expectation value of the land to produce rubber or the "RE" as above figured. Expressed in formula:

$$MGe = \frac{Yr\ (1.0p^{n-m} - 1)}{(1.0p - 1)\,(1.0p^{n-m})} + RE$$

Where:

MGe is the present value of the land and standing rubber.
Yr is the expected annual revenue from the present planting.
n is the total life of the present planting.
m is the present age of the estate.
RE is the expectation value of the bare land, and
p is the interest rate which is expected or demanded.

As an illustration of the operation of this formula let us assume we have a going estate in the same district for which we have previously calculated the expectation value of the bare land or "RE". If the estate is now 20 years old and the buyer calculates a further life of 15 years and the yield is only 500 pounds per acre, with a net return per pound of only 7 cents, due to higher operating expenses, the value of the property is ascertained by substituting in the formula using an 8% interest rate, as follows:

$$MGe = \frac{(500 \times 7¢)\ (1.08^{15} - 1)}{.08(1.08^{15})}$$ plus $89.35 or

$$\frac{\$35(3.172 - 1)}{}$$

.08 x 3.172 plus $89.35, or $299.56+ $89.35=$388.91

which is to say that the value of the property with the present stand of rubber and efficiency of management and with the assumed future stand and efficiency for future crops would be $388.91 per acre and at that value the investment would pay 8% annually. Again, as in the case of the calculation for "RE," this is no more than a measure of the upset price which could be paid for the property with the reasonable expectation of receiving 8% on the investment. A lower price would be expected, and offered, as the risks involved raise the rate of interest at which the calculation is put through.

It is to be noted that the formula does not take into

(*Continued on page 33*)

An installation of the rubber cushioned steel casting plates to form a grade crossing paving that is both permanent and resilient and may be, as shown on the right, easily taken up and replaced to permit of necessary adjustments to the tie system and roadbed

Rubber Cushioned Grade Crossings

An Ohio Inventor Produces a Readily Installed Paving for Railroad Crossings That Is Made to Absorb Shocks and Noise and Is Insulated by the Use of Rubber Cushion Pads

IN an attempt to lower maintenance costs for railroad grade crossings and at the same time facilitate repair work, a new type of paving unit is being introduced by its inventors, E. C. Price and T. L. Hanley, of Springfield, Ohio. The new units are rubber cushioned steel castings designed to form a permanent and resilient grade crossing that may be taken up and replaced easily and expediently in the case of tie repairs. They are manufactured by the Grade Crossing Paving Company, of which Mr. Price is president, and distributed by the Indianapolis Switch & Frog Company, of which he is vice-president. Both companies are located at Springfield, Ohio.

Grade crossings have always been an outstanding source of trouble to railroads because of the constant necessity of ripping up a whole stretch of pavement when slight adjustments have to be made in the tie system, the ballast or the road bed itself. Railroads, through the use of heavier equipment and units of greater tonnage capacity, have materially increased the wheel load of their rolling stock, thus necessitating more frequent lifting of the tie system.

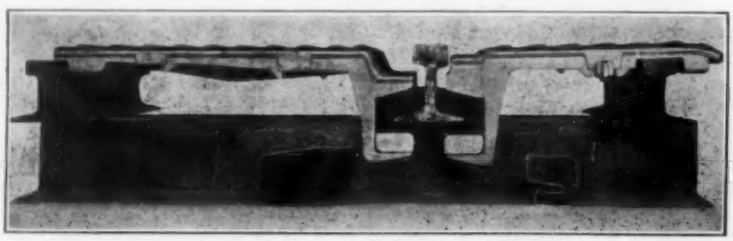
The rubber cushioned paver-plate units, as designed by Mr. Price, are uniform, interchangeable, interlocking, insulated and self-contained. They are cushion anchored to the track rails through inserts of rubber functioning as and similar to solid rubber tires, according to the inventor. The cushion feature is the chief factor in their performance and adaptability, as they are said to combine the principle of the solid rubber tire with that of the present day manhole cover.

"While I have for 35 years been active in designing, developing and distributing track fixtures," said Mr. Price, "this is the first general practice of which I have knowledge where this rubber cushion material has been utilized to such an extent. In the designing of these unit pavers, our research found nothing previously used for insulating material that was adaptable, and this led to the use of the rubber cushions. It was later discovered that the insulation was but a minor office of these cushions which act as adaptors and shock absorbers and add to the flexibility and self adjusting of the units.

"This has further led to research and development wherein this cushion material is placed underneath railroad crossings between two steel plates. The sharp impact and noise is very perceptibly reduced with the benefits that would naturally accrue. This is also being constructed for use under railway joints and in elevated track structures."

The present paver-plate units are described by their maker as having two hind legs that straddle a tie and two feet with rubber heels that engage the base of the track rail. The head and front feet rest on stringer rails, the arms interlock and the back or top has safety tread worts. Not only do the rubber cushions relieve the paving and vehicles passing over it from peak shocks of impact, but they assure perfect insulation without interference with automatic signals or train control.

The paver units are 20 inches in width and are furnished in multiples of four, two edge and two middle plates spanning each tie. Any width of street or highway may be covered by a series of these multiples which are adaptable to any height of rail, location or angle. No interruption of train movement or detour of vehicular traffic is necessary for resurfacing the track, as the plates open up easily from each side to the middle of the crossing and may be laid, opened or closed at the rate of one track foot per minute by a single section crew.



A cross section of a rubber-cushioned paver-plate unit, showing how the "rubber heels" engage the base of the track rail

The plates are being marketed under the name of "Bull Frog" paver units. They are one of the several types of paving materials manufactured by the Grade Crossing Paving Materials Company.

Sir Henry Alexander Wickham

1846-1926

THE rubber industry has lost a notable figure in the passing of Sir Henry Wickham, at his home in London on September 27, 1928. There was something about his life that typified the romance which has attended the growth of the rubber plantation industry in the Middle East since Sir Henry laid the foundations for this gigantic agricultural experiment when he courageously chartered a steamer in the upper reaches of the Amazon and smuggled the first seeds of the *Hevea Brasiliensis* from its habitat to the nurseries at **Kew Gardens, England.**

Henry Alexander Wickham was born in May, 1846. From his early days his interest in botany became the leading influence in his life and in the early 60's, he had begun his pilgrimages in the interest of science into the jungles of Central America, the coast of the Spanish Main and up the broad expanse of the Amazon. On one of these trips made between 1866 and 1876, he gave, in a published account, a description of the tapping of *"Ciringa"* (i. e. *Hevea*), known to the Cirangaros (rubber gatherers) of the upper Amazon, and drew a carefully executed diagram of the leaf and fruit of the tree. Sir Joseph Hooker, then director at Kew Gardens, was able from the illustration in question to describe the *"Ciringa"* tree botanically and gave it the name of *Hevea Brasiliensis."*

While still in the upper Amazon, Wickham received a commission from Sir Joseph Hooker, signed by Lord Salisbury, then Secretary of State for India, authorizing him to collect seeds of this special tree and have them conveyed to Kew Gardens. In the execution of this commission, Sir Henry Wickham, after a period full of discouragement and hindrances, ultimately delivered to Kew Gardens, on June 16, 1875, a consignment of 70,000 seeds. These seeds were paid for by the Government of India.

For some 12 months after his return to England, in 1876, Wickham placed his services at the disposal of the India Office in London. He was consulted frequently as to the destination of his seeds, large numbers of which were then sprouting under glass at Kew. The bulk of the rubber seeds were sent to Peradeniya and Henratgode in Ceylon whence, later in 1876 and 1877, seedlings were distributed to Singapore and elsewhere.

With these seeds the beginning of plantation industry in the Middle East can date. Other scientists in the early days contributed their share in the growth of the enterprise and Sir Henry Wickham has been gracious enough in his memoirs to credit the main initiative in the matter to Sir Joseph Hooker and Lord Salisbury, but the fact remains that it was Sir Henry that procured the seeds and successfully transported them in the first instance to Kew Gardens.

Strangely enough both the rubber planting industry and the world at large were slow to give due recognition to Sir Henry for the important work which he had accomplished. As a true conscientious scientist of the old school he sought no honor but secured his satisfaction from the knowledge of the service that he had rendered. It was not until 1911 and after he had reached the good age and was in not too affluent circumstances did the rubber industry throughout the world fittingly subscribe to an annuity. In later years, however, recognition and honors have been justly his reward. In 1920 he was knighted and in October, 1926, the Governments of the Straits Settlements and the Federated Malay States made a grant of £8,000 to this "Grand Old Man of the Rubber Industry."

It might be stated here that the recognition, which ultimately came to Sir Henry Wickham, was in no small measure due to the efforts of a small group of Americans and American manufacturing companies identified with the Rubber Industry.

Sir Henry was active up to practically the day of his death and was a conspicuous figure at various recent rubber exhibits and on the occasions of dinners or gatherings within British rubber circles. His life will remain one of the cherished traditions of the rubber industry.

Sir Henry Wickham Beside One of the Trees Grown from the Seed He Procured from Brazil, Now Standing in Ceylon

Some Problems *of* Maintenance *in* Rubber Factories

Every Modern Plant Will Find That an Adequately Equipped Machine and Carpenter Shop with Specialists in All Angles of Repair Work Is a Necessity for Economical and Efficient Upkeep

THE installation, care, and repair of mechanical equipment in a rubber factory, is one of the vital functions of plant management which when properly handled, reaps its reward in low expense of upkeep, uninterrupted production, and slow depreciation.

Two things are essential for adequate maintenance, whether the factory be large or small: proper equipment for repair work, and sufficient man-power to keep the wheels turning properly. This calls for a plant engineer or master mechanic who not only has the requisite knowledge and skill himself, but who is also able to run his department so that the man-power at his disposal works effectively. The problem is different from that of a production foreman whose men are constantly under his eye with their tasks laid out for them and usually the incentive to work, such as piece work or bonus. Repair jobs are never twice alike and are usually located at various points throughout the plant. This calls for personnel who are trained to work efficiently, often without supervision.

To handle all kinds of repairs, as well as make new equipment of an accessory nature, every factory is equipped with a machine and carpenter shop. This should be located on the first floor, if possible, in close proximity to the mill and calender departments, where most of the heavy machinery is located, and the boiler room and power plant. Overhead trolley connections from the mill room are essential so that heavy rolls can be conveyed to the machine shop for repairs without loss of time. In one end the pipe shop may be conveniently located, the machine shop with its lathes, planers, and drill presses in the center, and the carpenter shop at the further end, with the blacksmith shop in the rear with door connections to both departments.

Importance of Machine Shop

Here are employed various kinds of mechanics to operate the various machines, although in a small plant they may only work part time in the shop, acting as repair men when the necessity arises. Lathes are used for cutting and shaping various kinds of equipment such as bars for wind-ups on calenders, cutting out rolls for calender work, embossing, and knurling. Machinery for grinding calender rolls is used to eliminate rough marks caused by metal or dirt getting into the compound, to change the pitch of the roll in case a different type of a bank is required on friction work, and to keep the rolls tuned up. A modern tool room completes the equipment.

Most up-to-date mill rooms are equipped with overhead hoists and conveyors over their mill groups, to facilitate the removal of rolls in case of a break-down, necessitating the insertion of a new roll, gear, or frame.

The carpenter shop has considerable upkeep work to do repairing doors, windows, roofs, and skylights. A wood pattern maker should be on the force to construct new light mechanical apparatus patterns, which are in turn sent to a foundry for casting. Such equipment as hooks, racks, benches, shelves, and platforms may be constructed here, but modern practice leans toward more permanent construction of metal, such as pressed steel, which, while greater in initial cost, is cheaper in the long run, considering the life of the equipment and cost of repairs. The shop should be equipped with circular and band saws, planers, wood lathes, as well as the usual hand tools.

The blacksmith shop is becoming less of a necessity in the rubber factory due to the advance in the art of electric and acetylene welding. A welding outfit with several operators skilled in its use, can be used to make repairs in cracked castings of all kinds, as well as for cutting where equipment cannot be removed in any other way. It is also useful in making repairs to boilers, cement cans, and pipe joints.

Trouble Scouts Needed

The active repair force consists of a group of specialists on certain types of work, with the tendency for the men to become more versatile in smaller organizations. Oilers who do the routine work of oiling and greasing machinery, making periodic inspections of elevators, and so on, may also act as helpers on moving machinery. Every mill and calender department needs a trouble scout on the job constantly to see that the boxes are tight, the gears in right mesh, and that the operators take proper care of their machines. Common breakdowns that occur in this class of heavy machinery include cracking of mill frames, due to cold or hard stock, cracking of the rolls themselves, stripping of gears, broken or leaky pipe connections, broken chain links on wind-ups, and other less serious adjustments.

Moving heavy machinery such as mills, calenders, presses, etc., is frequently necessary, owing to breakage, change of layout, or the installation of new equipment. This work is usually done quickly in order not to hold up production. A skilled crew knows just how to handle jacks, rolls, and levers, in moving broken rolls out and rolling new machinery into place. On large jobs, often outside riggers are called in.

On the lighter machinery such as sewing machines, tubers, trimmers, etc., ordinary maintenance is frequently taken care of by an operator in the department who may combine repair work with other duties.

The installation and care of shafting, pulleys, and belting comes under the province of the millwright. The type of mechanic needed in this work is a man who can line up shafting properly so that the belts run smoothly on the pulleys and the proper speed ratio is maintained. The general routine of this work consists in lacing and greasing belts, and the care of elevators. Most states have laws covering elevator inspection, but it is advisable to check them often to avoid the possibility of accident.

In many ways the steam boiler plant is the most important care of the maintenance department. Analysis of water to avoid boiler scale, cleanliness of tubes, constant steam pressures, are both engineering and maintenance problems which have a vital bearing on the quality of the product. Economy in fuel and the proper type of fuel are matters of importance also. Aside from the boiler operators or firemen, which in the case of a plant operating at medium

or high pressures, must be licensed men, a force of skilled steamfitters is necessary to keep the steam system in good shape, joints tight, traps functioning, and vulcanizer recording instruments in order. Toilets and wash rooms require the services of a plumber, although this work may be done by the steamfitting force in small plants. Closely allied with this work is the care of hydraulic equipment used in connection with presses and vulcanizers, and air compressors which are used in all rubber plants.

As electric power is used in all rubber mills today, a force of electricians is necessary whether the power is purchased outside or made in the company's own power plant or furnished by water power. The electrician's duties are more of an operating than a maintenance nature. One of the big advantages of electrical operation is that it functions steadily from day to day. Construction work such as installing new motors, lighting and power circuits, occupies most of the electrician's time. The routine work consists of oiling and cleaning the apparatus. The oiling of motors should always be an electrician's job, as a mechanic unversed in motors does not know which parts require oil and which do not. Repair work consists of replacing blown-out fuses, worn insulation, etc., and is infrequent if wiring is enclosed in condulets and follows the underwriter's specifications.

Money spent on plant maintenance, properly supervised and furnishing the most durable and up-to-date materials, while charged as expense, is in reality adding to the life of the plant and machinery. It also furnishes indirect rewards in the uninterrupted flow of production.

Economic Position of Ceylon

IN the October issue of *Commerce Monthly,* published by the National Bank of Commerce in New York, the bank points out that the export commodities which brought fame to Ceylon are giving way to new export items.

"Pearls and spices, plumbago and rare woods, which formerly made the fame of Ceylon in the trading marts of the world, have been superseded by tea, rubber and cocoanut products. More than one-fourth of the world's commercial crop of tea and about one-tenth of the total rubber supply are produced there. Tonnage of vessels in foreign trade which enter the ports of Ceylon in 1926 was one-half as great as the tonnage in foreign trade entering New York harbor in that year."

"Rubber ranks second among Ceylon's export crops. The acreage of rubber plantations was practically the same as that of tea gardens in 1925. Small cultivators to the number of nearly 25,000 in 1924 were growing on holdings which amounted to about one-tenth of the entire area devoted to this crop. Ceylon's total shipments, 56,000 tons in 1927, formed about one-tenth of the world's production. Exports to the United States are two-thirds of the total."

Rubber Goods in the D. E. I.

IT IS interesting to note that as a leading producer of crude rubber, the Netherland East Indies also is a larger importer of rubber manufactured goods, according to the Department of Commerce. Imports of rubber goods amounted to $905,848 in 1926 and increased to $1,220,487 in 1927. Of this approximately $1,000,000 came from the United States. For the first half year of 1928 our exports are valued at $483,740, or 40 per cent of the entire year 1927.

Automotive rubber goods comprise 77 per cent of our total exports of rubber products to the Netherland East Indies. The next important class is mechanical rubber manufacturers, which is consumed in the various rice, sugar, tea, and tobacco establishments, as well as the local rubber plants.

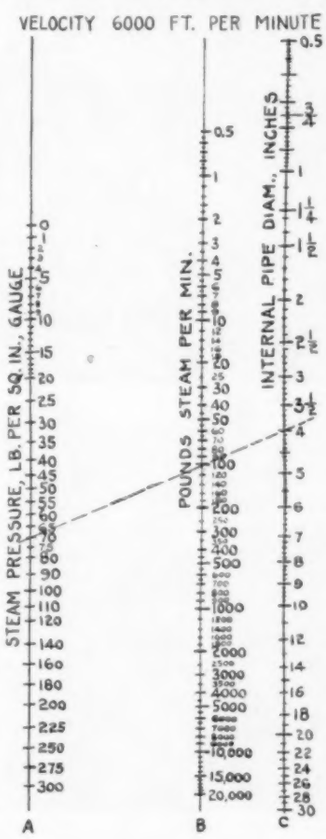
Schaphorst's CHATS *with the* ENGINEER

By W. F. SCHAPHORST, M.E.

Steam Flow Chart

THE simple chart shown below will be found useful by steam users in rubber plants for finding the number of pounds of steam flowing per minute through any pipe. The pipes may vary from a half inch to 30 inches in diameter. The chart takes care of any steam pressure up to 300 pounds per square inch gauge as indicated in Column A.

Owing to the fact that steam velocity through a pipe is most frequently quoted at 6,000 ft. per min. this chart is based on that velocity. However, it is a simple matter to convert results over to any other velocity when desired.



For example, if the steam pressure is 70 pounds per sq. inch gauge and the internal diameter of the pipe is 4 inches, how many pounds of steam will flow through the pipe per minute at a velocity of 6,000 feet per minute?

The straight dotted line drawn across shows how it is done. Connect the 70 pounds steam pressure, Column A, with the 4 in. internal pipe diameter, Column C, and the intersection with Column B gives the answer as slightly over 100 pounds of steam per min. In other words, any straight line drawn across the chart connecting any figure in Column A with any figure in Column C immediately gives the answer in Column B.

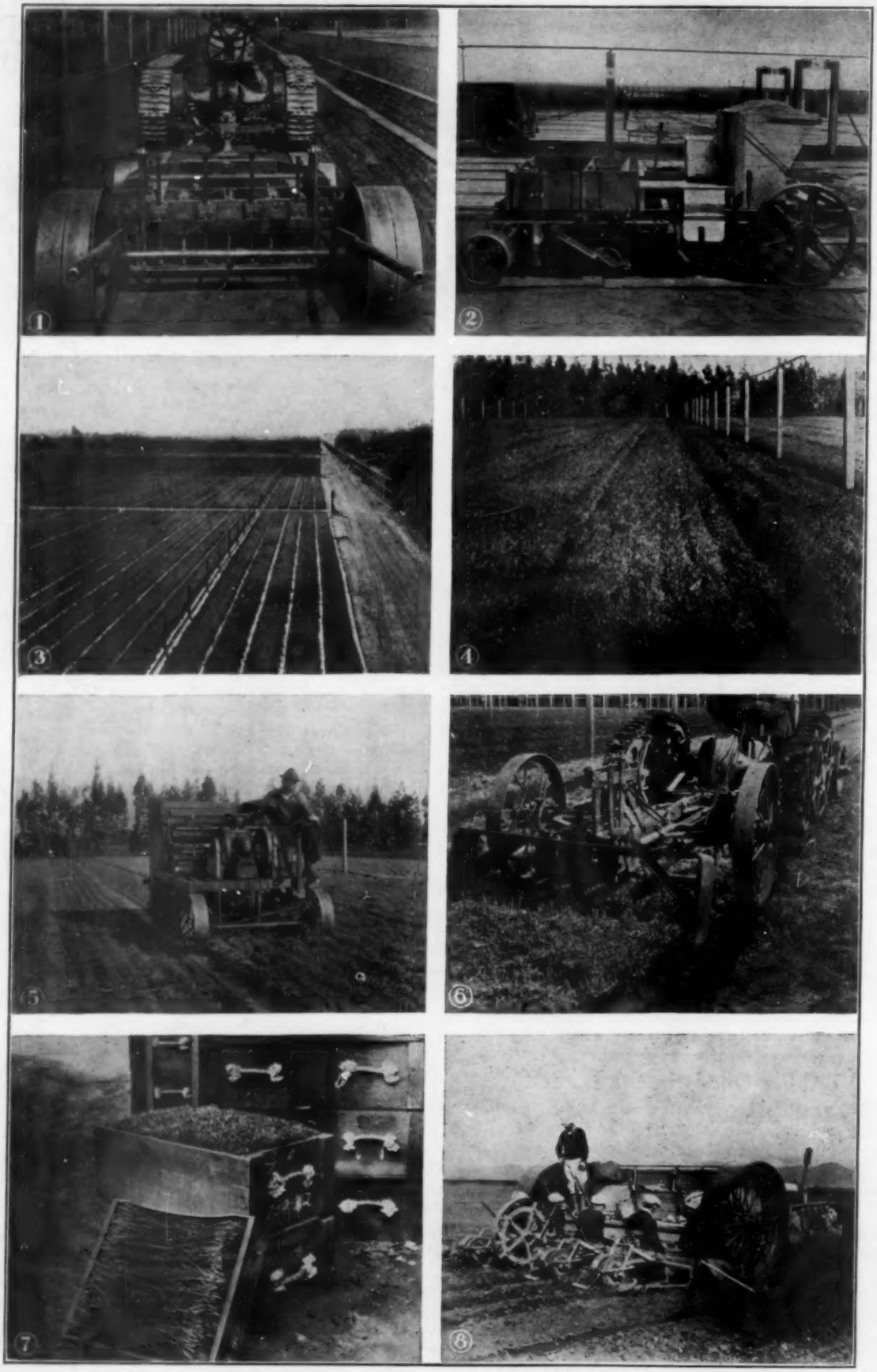
For any other velocity multiply the desired velocity by the result in Column B and divide by 6,000. Thus, if the velocity is to be 3,000 it is evident that only 50 pounds of steam would flow through the pipe per minute because 100 multiplied by 3,000 and divided by 6,000 equals 50.

As will be noted, the chart will compute any steam flow from ½ of a pound per min. to 20,000 pounds or 10 tons per minute.

Speed Reducers in Factories

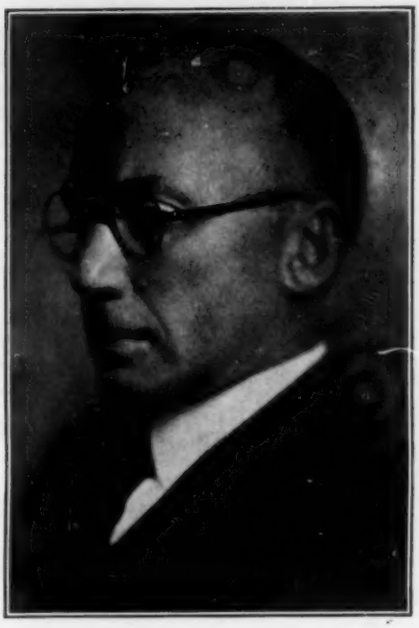
Unit drive, as provided by speed reducers, improves efficiency by facilitating more efficient plant lay-out, permitting close spacing of machinery and promoting orderly progress of the work through clear, well marked aisles. Worm gearing is the most compact type of reduction, and the right angle drive generally permits of placing the motor alongside the driven machine, out of the aisle.

Views of Intercontinental Rubber Company's Guayule Plantation



Bringing Guayule Into Central California

Modern Machinery Combined With the Most Scientific Botanical Research is Successfully Introducing This Mexican Rubber Plant Into the United States



GEORGE H. CARNAHAN,
President of the Intercontinental Rubber Company

THE largest experiment in the domestic cultivation of the guayule shrub ever attempted is being made by the Intercontinental Rubber Company in Monterey County, California. It is the first successful effort to grow rubber in the United States on a scale of sufficient size to make the project commercially worth while. The project refutes the long believed theory that guayule thrived best in its wild state in the desert expanses of northern Mexico. The successful project of domesticating this wild shrub is the result of 16 years of research and experimental work under the direction of Dr. W. B. McCallum. Not only has the experiment led to improved methods of cultivation of guayule but in the course of the years of intensive research the plant has been brought to yield a higher percentage of rubber than was present in the familiar Mexican variety.

The photographs on the previous page show various steps in the planting and maturing of the shrub on the California plantation. The same set of pictures is now on display in the Smithsonian Institute in Washington along with the first automobile tire made wholly of guayule rubber and manufactured by the Intercontinental Rubber Company.

As much of the labor and operations of the plantation as possible is done by machinery and no expense has been spared in developing labor saving methods. Seeds from desirable varieties are gathered by specially designed harvesting machines from standing shrubs. They are sown in the nursery beds and in about nine months are ready for transplanting.

The accompanying photographs show the planting process in sequence. The mulcher (1) gives the final preparation to the nursery bed by scratching the top soil so as to give a better reception to the seeds. Duck boards are then laid down and the seeder (2) feeds the seeds into the ground at a uniform rate. Sand from the rear of the seeder is automatically spread over the seeded ground in the same operation. Water in the form of an artificial rain is sprayed on the beds by the overhead pipe lines shown in several of the pictures. The beds, after a few weeks, take on the appearance as shown in the next photograph (3) and soon the nursery growth is complete (4).

A cutter (5) clips the tops of the shrubs just before transplanting and another machine (6) digs up the plants. They are then boxed (7) with approximately 5,000 plants in each box and are ready to be set out in the plantation. This is done by the transplanter (8) at the rate of 14,000 plants per hour. The rest of the process in the growth of the shrub to maturity is necessarily up to the plant, aided by a cultivator machine which periodically is run between the rows of plants and keeps down the weeds and grass. In the planting process each seedling is given about six square feet of soil, thus allowing 7,260 plants per acre.

The development of this plantation project has resulted in the complete domestication of the wild guayule shrub within 14 years and the production of a commercially practical quality of rubber as a field crop with a cycle of three or four years. The application of engineering principles and the use of specially designed machinery has made it possible for one man on this plantation at the prevailing wages in California to do the work of 16 men on the usual rubber plantation in the Middle East. At the same time the successful cultivation of a commercially available form of caoutchouc has been extended northward through 25 degrees of latitude.

A Section of the California Plantation of the Intercontinental Rubber Co. Showing One Year Old Guayule

The Same Section Taken From the Identical Spot One Year Later Showing the Growth That Has Taken Place

RUBBER CHEMISTRY and Technology

Health Hazards in the Rubber Industry—Organic Accelerators and Anti-Oxidants

By L. J. D. HEALY

Technical Superintendent, Federal Division, The Fisk Rubber Company, Cudahy, Wis.

THIS paper is a continuation of a similar paper on the health hazards of compounding materials used in the rubber industry and presented by the writer before the Rubber Section at the last annual safety conference.

In the latter paper the various compounding materials used in the rubber industry were classified into four groups:

1—Accelerators and dry organic compounds.
2—Dry inorganic compounds.
3—Gums, resinous materials and waxes.
4—Liquids and gases.

The method of classification and description of these compounds was taken up in detail and complete description of a considerable number of the organic compounds listed under Group No. 1 was completed. The data presented at that time has since been used as a basis for compiling a Safe Practices Pamphlet, the work having been continued by the Health Hazards Committee upon recommendation of the Rubber Section, and the pamphlet issued by the National Safety Council.

The work thus far has dealt only with the organic accelerator group. Of the four groups or types of compounds, the organic accelerator group consists of a comparatively new series of substances used for rubber manufacture. As a group, they are the least understood and most dangerous to handle from the health hazard standpoint.

With the presentation of this paper, the writer completes the classification and description of the accelerator group. Several new accelerators have been developed during the past year and put into commercial production, and these have been added to the list as prepared in the previous paper.

New chemicals for use in rubber manufacture are being continually developed with the result that an increasing number and variety of organic substances are being offered on the market, often to the confusion of the rubber manufacturer and due to conflicting claims of the distributors. In this present age of competition, the accelerator manufacturer is only too anxious to get a promising accelerator on the market, often before adequate data has been obtained either as to its value for rubber work or as to the health hazards involved in the handling of the material. On the other hand, the rubber manufacturer, being only too anxious to improve his product, is often tempted to accept the exaggerated statements of accelerator salesmen, and jumps into production with an unknown and untried substance resulting in untold factory trouble, as well as possible injury to the health or comfort of the employes using these materials. Numerous cases of the latter have occurred during the past few years with the advent of organic accelerators and softeners.

A recent issue of an English rubber journal contains a report of the chief inspector of factories and workshops of Great Britain for the year 1927, which shows an increase of dermatitis amongst rubber workers of 96 per cent in 1927 as over the year 1926. Nineteen of these were caused by the use of accelerators, whereas these agents were held responsible in only seven cases in 1926.

While the writer has no definite record of this kind for American factories, he believes that dermatitis and illness caused by accelerators is decreasing in the United States rather than increasing due to the more intelligent use of accelerators.

In these Safe Practices Pamphlets prepared by the Health Hazards Committee of the Rubber Section, and issued by the National Safety Council, we have endeavored to show the composition of these accelerators, their probable toxicity or irritant effect, and wherever possible suggestions of handling which will remove all hazards. We believe that if these suggestions are followed, but little, if any, hazard will be experienced in handling these compounds. In a few instances, the use of very toxic accelerators has been discouraged since with the large variety we have to choose from at the present time there can usually be found a suitable substitute.

It has been very gratifying to note that a number of the large reputable chemical companies are now making a study of the toxicity of their accelerators and organic compounds before offering them to the trade, and in many cases guarantying them to be non-poisonous and non-irritant. This practice is to be commended. The more knowledge we have concerning the materials we are using, the more intelligently can we handle the same.

The classification and description of accelerators appended hereto will therefore complete the list of most of the organic accelerators in common use today. As new accelerators come into general use, the Health Hazards Committee can add these to the list from time to time and thus keep the latter up to date. The committee will be glad to receive any information concerning unusual conditions or symptoms of trouble arising through the use of accelerators. It is hoped that the various manufacturers will send in to the committee any information which they think will be of interest to others in avoiding troubles. We are especially interested to learn of any trouble developing from the use of rubber compounding ingredients.

I will now take up a new group of organic compounds, which has invaded the rubber manufacturing field since the writer's first paper was prepared. This group of compounds consists of the so-called anti-oxidants for preserving the life of rubber.

Since the discovery of vulcanization by Goodyear in 1839, practically no advance had been made in the vulcanization of rubber until the discovery of organic accelerators about a decade and a half ago. Previous to the use of accelerators, the normal life of most vulcanized rubber goods was comparatively short. With the extended use of accelerators during the past ten years, it has been noted that certain of these accelerators not only shortly cut down the time of vulcanization but they also greatly improved the physical properties of the rubber goods and also made them more resistant to deterioration.

The principal factors contributing toward the deterioration of vulcanized rubber are: light, heat and oxygen. Rubber may be protected against the action of light by storage in darkness or by compounding in such a way as to prevent excessive absorption of the actinic light rays. Resistance to heat may also be obtained to a considerable extent by proper compounding. Atmospheric oxygen still remained to be the most destructive factor.

Certain types of accelerators have appeared to offset this oxidation to a considerable extent and has led to an intensive study of those particular organic groups which best resist oxidation. The search has resulted in this new body of organic compounds which have been named "anti-oxidants," and which promises to be the next great advance in the vulcanization of rubber goods. They have been given considerable publicity and have come into quite general use during the past year. A canvass of the various rubber companies indicates that most of the latter are using or at least experimenting with one or more of these compounds.

These anti-oxidants are organic compounds similar in many respects to the organic accelerator group. There are approximately about a half dozen of these compounds in quite general use. They are sold mostly under various trade names. Some of these compounds are derived from toxic bases and others are of such compo-

sition that those using them should be on the lookout for dermatitis. In general they are substances which can be safely handled with reasonable precautions. A study is being made of their toxic and irritant properties and as soon as this is completed, these substances will be classed as a sub-group under the accelerators and dry inorganic compounds. Sufficient data has not yet been accumulated for the writer to complete the anti-oxidant group in time for this meeting. However, for the benefit of those using these substances, the following list comprises those in most general use, together with their basic composition and probable toxic or irritant properties:

Age-rite powder

A gray powder melting at approximately 100° C. and consisting of phenyl-beta-naphthylamine. Probably slightly toxic and should be handled according to instructions noted under the naphthylamine group of accelerators.

Age-rite resin

A red resinous substance, brittle when cold and liquid at milling temperatures. Contains adol-alpha naphthylamine. General precautions as noted for the age-rite powder should apply.

Antox

A tan colored powder containing para-amino phenol. A combined accelerator and anti-oxidant. No trouble reported from its use. Possibility of slight dermatitis.

Neozone

A purplish gray waxy compound containing phenyl-alpha naphthylamine with meta toluine diamine and some acid wax. Quite safe to use with ordinary precautions. Probably slightly toxic. No danger of dust.

Oxynone

A light brown powder, oxidizing in moist air. It is an amine derivative, which should be handled with some care to prevent staining of the flesh or possible dermatitis.

Resistox

An aldehyde condensation product in the form of a pinkish buff powder. No data as to toxicity but its general composition would indicate no hazard involved in its use.

Stabilite

A yellowish compound readily turning purple upon exposure. Consists of di phenyl ethylene diamine. Probably somewhat toxic but involving no hazard with careful use.

V. G. B.

A brown resinous powder consisting of acetaldehyde alpha naphthylamine. Qply slightly toxic. Has been used in large quantities. No trouble other than slight dermatitis reported.

A description of these compounds will later be issued to be appended to the accelerator and organic group.

Lead Oxidation Product of Dimethyl-Dithio-Carbamic-Acid

Origin and Constitution:

The lead oxidation product of dimethyl-dithio-carbamic acid is prepared by oxidizing the lead salt of dimethyl-dithio-carbamic acid, $[(CH_3)_2$. N-CS-S$]_2$Pb. It is one of the very powerful ultra accelerators and for this reason is seldom put on the market in the pure state, but usually in a diluted form on a clay base. In the latter form it consists of a very fine gray to yellowish-white powder and with only a slight odor. It has a specific gravity of 2.50.

Uses:

This material is used commercially as a rubber accelerator. It is used principally in dark-colored goods in conjunction with litharge, finding a quite extensive use in mechanicals, footwear and dry heat stocks. It reacts at low vulcanizing temperatures the range being from 250° F. to 280° F.

Litharge is required to activate the accelerator. It has a tendency to scorch on the mill, and temperatures must be carefully controlled.

Health Hazards:

Being a dry powder, this accelerator is usually weighed out in the compound room in the usual manner and added directly to the rubber on the mixing mills. It is a lead salt but is relatively insoluble and comparatively little danger is involved in its use. However, it is invariably used in conjunction with litharge and the same precautions should be observed when handling this accelerator as noted under the use of lead compounds.

The compound weighers and mill operatives should avoid handling with bare hands and be careful not to inhale the dust. Such small amounts of the active ingredient are used that the danger from poisoning is slight. The real danger is from the litharge, which is invariably used in conjunction with this accelerator. No cases of dermatitis have been reported.

Methylene-Ditolyl-Diamine

Origin and Constitution:

Methylene-ditolyl-diamine is the reaction product of formaldehyde and two molecular portions of para toluidine. It has the formula $(CH_3C_6H_4\ NH)_2\ CH_2$ and is similar in properties to methylene para toluidine, the latter being formed when formaldehyde reacts with one molecular portion of para toluidine.

Uses:

Methylene-ditolyl-diamine is a mild accelerator for vulcanizing rubber. Due to its low accelerating power it is now practically obsolete as an accelerator.

Health Hazards:

The health hazards of this material are about the same as for methylene para toluidine. It is non-poisonous except as traces of formaldehyde or para toludine are present as impurities. No ill results of its use have been reported.

Methylene-Para-Toluidine

Origin and Constitution:

Methylene-para-toluidine, also known as anhydro formaldehyde para toluidine, is a grayish or yellowish white powder with faint aromatic odor. It has no definite melting point but softens between 80° and 100° C. It is not a definite chemical compound but a mixture of two isomers having the formula $CH_3\ C_6H_4\ N = CH_2$. It is prepared by the action of formaldehyde upon para toluidine in equi-molecular proportions.

Uses:

This material is used quite extensively in many lines of rubber manufacturing including mechanical rubber goods, tires and tubes. It is used both as an accelerator and a rubber softener. It is also an excellent plastisizer and anti-scorching material and for this reason is often used in conjunction with more powerful accelerators to counteract the scorching tendency of the latter. It is used up to 2 per cent on the weight of the rubber present. Zinc oxide is usually used with it as an activator.

Health Hazards:

Methylene-para-toluidine is handled in much the same way as other dry powders, being weighed out in the compound room and the powder either added directly to the rubber or mixed with the other powders. The powder does not fly excessively and no special precautions need be taken in weighing out. It is non-poisonous if pure and causes no skin rash. However, the commercial product may contain traces of aldehyde or toluidines and for this reason it is advisable for the weighers to refrain from handling the material with the bare hands.

During the mixing and calendering operations some volatilization takes place and pungent aldehyde fumes cause irritation to eyes and respiratory organs. Mills and calenders should accordingly be hooded, with suction to remove these vapors.

This material has had an extensive use in the rubber industry and when above precautions have been observed, no ill effects have been reported.

Para-Nitroso-Dimethyl-Aniline

Origin and Constitution:

Para nitroso dimethyl aniline is a green crystalline substance with a melting point of 88° C. and having the formula $(CH_3)_2$. N. C_6H_4. NO. The commercial dried product contains about 2 per cent moisture and 95 per cent para nitroso dimethyl aniline on the dry basis. The latter is soluble in both rubber and water and melts at about 80° to 85° C. The dried product absorbs moisture very rapidly from the air and undergoes decomposition when exposed to air. For this reason the material is also marketed as a paste containing a definite amount of water, usually 40 per cent.

Uses:

Para nitroso dimethyl aniline is used as an intermediate product in organic synthesis and a rubber accelerator. It is a fairly powerful accelerator and has been used quite extensively in the hard rubber and pneumatic tire industries.

It readily disperses in rubber exercising a pronounced softening action with little danger of scorching. It may be used in the proportion of from ½ to 1 per cent of the rubber. It may also be added to the rubber by soaking the latter in a water solution, previous to adding the compounds. It cannot be used for white or light colored goods since it has a discoloring action.

Health Hazards:

This material may be weighed out as a powder or paste, or dissolved in water. There is a certain amount of danger from handling this material by any of these methods. The material is poisonous and has a decided tendency to cause disagreeable skin eruptions. Care should be exercised in handling, and the material should not come in contact with the skin.

During mixing and calendering it gives off a disagreeable odor but does not fume seriously. The mill and calender operatives should avoid handling the hot stock with the bare hands as far as possible since it is conductive to dermatitis. Since it is almost impossible to handle stock of this nature through the plant without danger, its use has been discontinued by some manufacturers. It

is advisable to use less poisonous accelerators wherever it is possible to do so.

Reference: Jr. Ind. and Eng. Chem. 1918, P. 865; Hamilton—Ind. Poisons in the U. S.—1925, P. 502-524.

Phenyl-Tolyl-Guanidine

Origin and Constitution:

Phenyl-tolyl-guanidine is a white crystalline powder having the formula $C_6H_5.NH.CH_3C_6H_4NH.C:NH$. It is slightly soluble in rubber.

Uses:

Phenyl-tolyl-guanidine is used commercially as a rubber accelerator, but to a lesser extent than many of the other accelerators. It is a relatively active accelerator, comparable in most respects to diphenyl guanidine.

Health Hazards:

Being a dry powder this material can be handled conveniently in the compound and mill rooms. It can be weighed out in the usual manner and added directly on the mills. It does not fly excessively nor does it fume during mixing. It is a safe accelerator to use. No cases of poisoning or of dermatitis from its use have been reported.

Quinoidine

Origin and Constitution:

Quinoidine is a dark brown resinous substance having no definite melting point. It softens between 80° and 100° C. It consists of the uncrystallizable portion of the extract of cinchono bark. It is obtained from the latter solution after all the crystallizable alkaloids have been removed. The commercial material is put on the market in a very impure form, often being contaminated with appreciable quantities of foreign matter.

Uses:

Quinoidine is used in medicinal preparations and as an accelerator for rubber. It is no longer popular as a rubber accelerator since it has the disadvantages of imparting a disagreeable odor to the rubber and has a tendency to scorch during milling. It is only a mild accelerator requiring from 1 to 2 per cent upon the weight of the rubber. Zinc Oxide is necessary to activate the accelerator.

Health Hazards:

It is a comparatively safe accelerator to use. It does, however, give off a strong penetrating and disagreeable odor during the milling and calendering operations. Its use in the rubber industry is now almost obsolete.

Tetramethyl-Thiuram-Disulphide

Origin and Constitution:

Tetramethyl-thiuram-disulphide is a grayish crystalline substance having a melting point of 150° C. and a specific gravity of 1.29. It belongs to a class of organic accelerators known as the thiuram disulphides. They are prepared by oxidizing the corresponding dithiocarbamates. The tetra methyl salt is the one best known in the rubber trade and is prepared by oxidizing the reaction product of dimethyl amine and carbon disulphide. The commercial product is prepared as a fine powder. It is insoluble in water but soluble in benzene or carbon disulphide.

Uses:

This material is used quite extensively as a rubber accelerator in all types of rubber goods. It is an extremely powerful accelerator and one of the best known low temperature ultra accelerators. It is used in proportion of from ⅛ to 1 per cent on the weight of the rubber. It is usually used in conjunction with zinc oxide as an activator.

Health Hazards:

This accelerator is a dry non-hydroscopic powder and non-poisonous. It can therefore be weighed out in the compound room safely and added directly to the rubber on a mill or put up in the form of a master batch. There is no fuming on mills or calenders. No ill results of its use have been reported.

Tetra-Methyl-Thiuram-Monosulphide

Origin and Constitution:

Tetra methyl thiuram monosulphide is a yellow crystalline powder having a melting point of 103° C. Its chemical constitution is represented by the formula (CH_3) NCS.S. CS.N $(CH_3)_2$. It is similar in many properties to the thiuram disulphide but does not react at as low temperatures as the latter. For this reason it can be handled to better advantage than the disulphide for many types of rubber compounds.

Uses:

Its principal use is an accelerator for the vulcanization of rubber. It is an extremely powerful accelerator and is used quite extensively for many classes of rubber goods. It is usually used in comparatively small quantities, of from 1/10 to ½ of 1 per cent on the weight of rubber.

Health Hazards:

Being a dry non-hygroscopic powder it is easily handled. It is non-poisonous, non-fuming and no hazard has been encountered in its use for rubber work.

Triethyl-Trimethylene-Triamine

Origin and Constitution:

Triethyl-trimethylene-triamine (T.T.T.) is a brown viscous liquid having a boiling point of approximately 207° C and a specific gravity of 0.89. It is quite soluble in rubber. It has the formula $[(C_2H_5.N:CH_2)_3]x$.

Uses:

T.T.T. is prepared for use as an accelerator in the vulcanization of rubber. It is a very active accelerator, especially in the presence of zinc oxide. While not used to as great an extent as many other accelerators, it does find considerable application in certain lines of dry heat vulcanization and is adaptable for sheet goods and for boot and shoe work.

Health Hazards:

T.T.T. is classed as a safe material for accelerator purposes. It should be carefully handled however. A number of cases of dermatitis caused by its use have been reported. Certain persons appear more susceptible than others. Persons who have previously suffered from "Hexa Rash" will often develop dermatitis from handling T.T.T. stocks. If reasonable precautions are observed to prevent direct contact with the hands and clothing, no serious difficulty should be experienced in its use.

Tri Phenylguanidine

Origin and Constitution:

Triphenylguanidine is a white crystalline substance having a melting point of 145° C. and specific gravity of 1.10. It is prepared by the action of aniline on thiocarbanilide and has the formula $(C_6H_5NH)_2C:NC_6H_5$. It is insoluble in water but slightly soluble in rubber. It is a very stable material being unaffected by exposure to light or air.

Uses:

Triphenylguanidine is used quite extensively as a rubber accelerator. It is a mild accelerator, but is adaptable for white and light colored goods and in compounds requiring a long range of cure. It can be used for nearly all classes of rubber goods and due to the fact that it has no tendency to cause scorching it has been very popular with the rubber trade. Its use as an accelerator is falling off in favor of newer and more powerful accelerators.

Health Hazards:

Triphenylguanidine, if pure, is non-poisonous and odorless. It does not fly badly and can be handled easily in both compound room and mill room without danger. The material is non-volatile and causes no danger from fuming at the calender.

Several impurities may be present in the commercial product, the most dangerous one being free aniline. A careful check should be made to detect any undue excess of aniline. It is a very safe accelerator and no health hazards are involved with ordinary care.

Xanthates

Origin and Constitution:

The Xanthates are extremely powerful accelerators being amongst the most powerful of the ultra accelerator type. There are several commercially available Xanthate accelerators, namely, Zinc butyl xanthate, zinc ethyl xanthate and zinc isoprophyl xanthate. They are white powders, finely ground and quite stable. They do not readily take on moisture from the air. The zinc salts are prepared by the reaction of zinc sulphate upon the corresponding sodium xanthate and their general formula is

$$Zn(S:C\begin{matrix}S\\OR\end{matrix})_2.$$

Uses:

The zinc xanthates are used as rubber accelerators but their use is decidedly limited due to the fact that they react at very low temperatures and cause scorching, especially if used in conjunction with zinc oxide. They are used for the most part in quick curing cements and specialties which are cured either very rapidly or at low temperatures. A xanthate cement will cure in less than one minute. Wherever used special precautions are required to prevent premature setting up of the rubber stock.

Health Hazards:

The zinc xanthates are dry powders which can be easily handled in the weighing and milling departments. Comparatively little data has been accumulated relative to their toxic properties, but their chemical grouping would indicate that they are relatively harmless for rubber work, especially where used in such small quantities.

Zinc Oxidized Salt of Dimethyl Di Thio Carbamic Acid

Origin and Constitution:

The oxidized zinc salt of dimethyl di-thio carbamic acid is one of the very powerful ultra accelerators used for low temperature vulcanization. It may be obtained either in the pure undiluted state or in a diluted form in which the oxidized zinc salt is mixed

with an inert clay base. It is a fine gray to yellowish white powder having a slight not unpleasant organic odor. It has a specific gravity of approximately 2.00. It is decomposable upon heating.

Uses:

The material was developed for use as a rubber accelerator. It is very active at low vulcanizing temperature and is very difficult to handle on mixing mills without scorching of the rubber. Due to this difficulty it has not found extensive use in the rubber industry. Its use is confined largely to specialties and vulcanizing cements.

Health Hazards:

This accelerator is non-poisonous and causes no disagreeable or harmful fumes during mixing. No ill effects from its use have been reported.

Rubber Plantation Valuation

(*Continued from page 23*)

account the book or cost value of such improvements as roads, buildings, factory, etc., except as they influence the net return that can be expected from the crop. It is the net return which is the controlling factor in the formula and, should the buyer calculate that he could improve this rate by better management or additional improvements after purchase, this would be a matter for separate calculation. The present or book value of improvements are fully reflected in the net return used in the formula and otherwise costs prior to the date of transfer are of concern only to the seller, and such costs probably will be given consideration by him in determining whether he considers the proposed sale advantageous or not.

It is believed that the above formulae, if conservatively used, will be of use both to present owners of estates and to prospective purchasers in determining reasonable values for both producing rubber estates and new possible plantation areas which are as yet undeveloped. It is not contended that their use will do away with the necessity for careful examination of properties and the inventory of assets. On the contrary such examination is necessary to some extent to obtain the correct figures for substitution in the formulae. Nevertheless this method does afford a common meeting ground for buyer and seller and a yardstick for measuring values which is fair to both. Moreover it takes into account the compound interest factor which, when neglected, so often obscures true values.

Wholesale Price Index

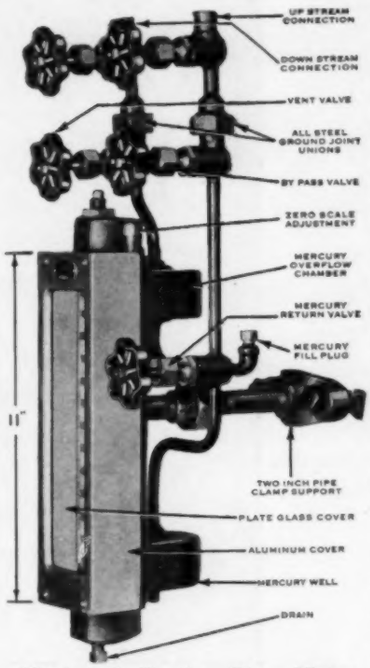
BETWEEN August 15 and September 15 the wholesale price index of the National Bank of Commerce in New York showed another small advance. In September the Bank's index stood at 87.8 compared with 87.6 last month and 85.1 in September, 1927. As measured by this index the trend of prices in the United States has closely paralleled the movement of prices abroad.

Gains were generally reported last month in the markets for agricultural commodities. Cattle and hogs sold higher; supplies are on the short side of the animal cycles and prices are now 30 to 50 per cent respectively above the lows for the year. Corn recovered completely from the drop of last month while wheat rallied a trifle. The decline in cotton continued on an upward readjustment of the government estimate of the new crop. Losses were general among the groups of tropical products such as sugar, coffee, rubber and burlap.

Indicating Flow Meter

THE Meriam Company, Cleveland Ohio, has recently placed on the market a new type of indicating flow meter suitable for measuring the flow of air, gas, saturated or superheated steam, oils and other liquids at any temperature, vacuum or pressure.

Primarily the meters are designed for high line pressures, 1000 lbs. per square inch or even higher, but with slight modifications they may be used with equally satisfactory results on vacuum or on low pressures. Their operation depends upon the fact that the flow of the liquid or gas causes a loss of pressure along the pipe. To insure correct readings, an accurately - proportioned orifice-disc is placed in the path of the flow in the pipe, and two small tubes are connected to the pipe line, one on each side of the orifice disc. The difference in pressure between the two sides is recorded by the level of mercury, or other non - evaporating liquid of constant weight. The orifice-disc is made of Monel metal. The scale may be calibrated in cubic feet, barrels, pounds, gallons, or other quantities per hour if desired.



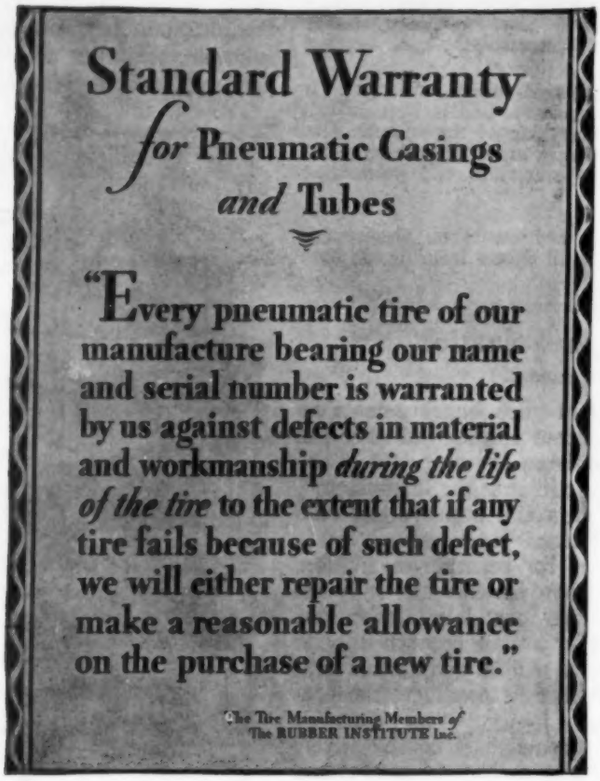
Meriam Indicating Flow Meter

The construction of these meters presented some interesting features. All pipe-lines, valves, etc., in the meter connections are welded instead of using threaded unions. The new atomic hydrogen welding was used; and this method, it is stated, not only makes a solid and non-porous weld, but also requires no extra grinding or finishing to give a clean finish.

10 YEARS AGO

Items Reprinted from October 10, 1918, Issue of THE RUBBER AGE

IN FIVE days the Akron district oversubscribed its quota of more than $10,000,000 for the Fourth Liberty Loan . . . The Goodyear Tire & Rubber Company has filed its formal answer to the complaint brought against it by the Federal Trade Commission under the Clayton Act for alleged price fixing and other "unfair" practices . . . The Fourth Annual Exposition of Chemical Industries at Grand Central Palace, New York City, contained many exhibits of interest to the rubber industry . . . Employment of women in rubber factories is now almost universal . . . Manufacturers of rubber toys are said to be going out of business until the end of the war . . . The Goodyear Tire & Rubber Company in one year made a salvage of $3,000,000 worth of waste materials . . . Lieut. William H. Eyler, who was with the Goodyear labor department for five years, has been killed in action in France . . . Representatives of 12 tire filler manufacturers met in Chicago to form an association known as the American Tire Filler Industry, Inc. . . . The Manhasset Manufacturing Company is building a $40,000 tire factory at Putnam, Conn. . . . Essex Rubber Company, Trenton, N. J. has a contract for 50,000 gas masks . . . Miller Rubber Company sales are running at the rate of $18,000,000 for 1918 . . . Robert E. Lee, superintendent of labor at the Firestone Tire & Rubber Company, has become personnel chief in the United States Army Quartermaster's Department . . . Conservation Division of the War Industries Board is working on a reduction of solid truck tire sizes from 100 to 14 . . . Mason Tire & Rubber Company is to make rubberized raincoats for the army . . . J. W. Herron made the best gross and E. M. Brunn the best net score in the Second Annual Rubber Association of America Golf Tournament at Trenton, N. J.


Standard Warranty
for Pneumatic Casings
and Tubes
"Every pneumatic tire of our manufacture bearing our name and serial number is warranted by us against defects in material and workmanship during the life of the tire to the extent that if any tire fails because of such defect, we will either repair the tire or make a reasonable allowance on the purchase of a new tire."
The Tire Manufacturing Members of
The RUBBER INSTITUTE Inc.

This revised warranty has been put before the public through the biggest campaign of advertising ever undertaken by the industry at large.

Its success as a merchandising help is in the hands of the tire dealers.

Director General,
THE RUBBER INSTITUTE, INC.

—an association of manufacturers organized "to promote in the industry a mutual confidence and a high standard of business ethics; to eliminate trade abuses; to promote sound economic business customs and practices; to foster wholesome competition; . . . and thus generally to promote the service of the industry to the public welfare."

85 million advertisements, in the newspapers, farm papers and magazines have spread this message to the tire users from coast to coast.

"The manufacturers listed below, who produce over 95% of the tires made in America, guarantee tires bearing their names and serial numbers against defects for the entire life of the tires."

AJAX RUBBER COMPANY, INC.
THE BADGER RUBBER WORKS
THE BRUNSWICK TIRE CORP.
THE COLUMBUS TIRE & RUBBER CO.
COMBINATION RUBBER MFG. CO.
THE COOPER CORPORATION
CORDUROY TIRE COMPANY OF MICHIGAN
THE DENMAN CORD TIRE CO.
THE DIAMOND RUBBER CO., INC.
DUNLOP TIRE & RUBBER CO.
EMPIRE TIRE & RUBBER CORP. OF N. J.
THE FALLS RUBBER COMPANY, INC.
THE FEDERAL RUBBER CO.
FIDELITY TIRE & RUBBER CO.
FIRESTONE TIRE & RUBBER CO.
THE FISK RUBBER COMPANY, INC.
G. & J. TIRE CO.
THE GENERAL TIRE & RUBBER CO.
THE GIANT TIRE & RUBBER CO.
THE B. F. GOODRICH COMPANY
THE GOODYEAR TIRE & RUBBER CO.
HAMILTON RUBBER MFG. COMPANY
HARTFORD RUBBER WORKS CO.
HOOD RUBBER COMPANY
INDIA TIRE & RUBBER COMPANY
KELLY-SPRINGFIELD TIRE COMPANY
LAMBERT TIRE & RUBBER CO.
LEE TIRE & RUBBER COMPANY
LEVIATHAN TIRE & RUBBER CO.
THE M. & M. MFG. CO.
THE MANSFIELD TIRE & RUBBER CO.
MARATHON RUBBER CO., INC.
McCLAREN RUBBER CO.
MICHELIN TIRE COMPANY
THE MILLER RUBBER COMPANY
THE MOHAWK RUBBER COMPANY
MONARCH, THE HARTVILLE RUBBER CO.
MURRAY RUBBER COMPANY
THE NORTHERN RUBBER COMPANY
THE NORWALK TIRE & RUBBER CO.
OVERMAN CUSHION TIRE CO., INC.
RACINE RUBBER COMPANY
THE REPUBLIC RUBBER CO.
REVERE RUBBER CO.
SAMSON TIRE & RUBBER CORP.
THE SEIBERLING RUBBER COMPANY
STANDARD FOUR TIRE COMPANY
UNITED STATES RUBBER COMPANY

THE HUNDRED THOUSAND DEALERS widespread throughout the country who handle standard tires and who display this warranty, add a further value to the consumer's purchase in the services they render locally for his immediate convenience . . .

—giving expert advice on proper size and type
—mounting and dismounting
—checking inflation
—checking wheel alignment
—maintaining repair service

By availing themselves of these expert facilities, car owners secure maximum mileage from their tires.

The workmanship of the tire builder and the services of the tire dealer are thus linked together in support of the manufacturer's warranty.

THE RUBBER INSTITUTE, INCORPORATED

What You Want —When You Want It!

Makers of Flynn "C" Shape Tube Molds

QUALITY work—promises kept—quick service—personal attention to large or small orders—special tire building machinery built to your order—develop your own ideas—respect your confidences.

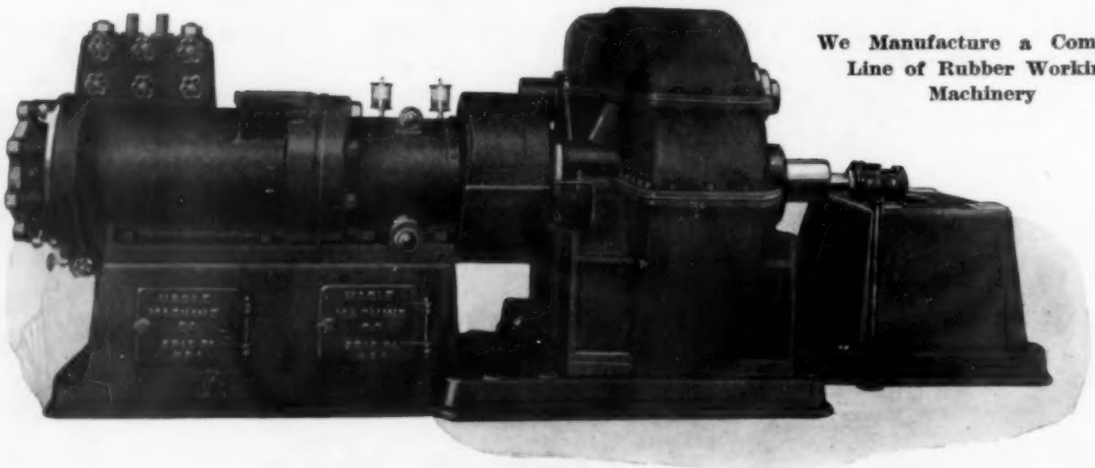
That's the type of service you will appreciate especially since it is backed by years of experience in tire mold and core making.

Try this service! When you have problems let us work them out for you. Our plant will act as an auxiliary to your own.

THE AKRON EQUIPMENT CO., Akron, Ohio

East Exchange at Annadale

TUBERS of QUALITY



We Manufacture a Complete Line of Rubber Working Machinery

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NAGLE MACHINE COMPANY

ERIE, PA., U. S. A.

SUCCESSOR TO ALLEN MACHINE CO.

EDITORIAL COMMENT

Rubber's Next Move?

THERE are times in the course of watching the ics, certain movements upward or downward seem crude rubber market when, according to mathemat- to be almost a certainty. And history has shown that as often as not the trend has been in the opposite direction from what was predicted. If it were possible to assemble the history and data of the crude rubber purchases of all the rubber companies in the country over a five year period, the result would form the basis of an interesting study. But it is sure that there would be no consistency in such purchases, no meeting of the minds at any given time. Some would be long at a period when others were short, and so on.

During the past few months there has been little to arouse action in crude rubber as the movement has generally been of a sidewise nature and the fluctuations narrow. But as November 1st, the date of the removal of restriction, nears, speculation on the course of prices in 1929 increases. Some companies have already bought part of their commitments in the belief that the worst has been discounted and that such purchases will eventually prove profitable. Others are waiting. While there is a nervous undertone in the market today, price levels have held fairly steady for several weeks.

With the restoration of a free market, the first since 1922, we shall undoubtedly see the forces of supply and demand brought into full sway again. Whether the plantations will endeavor to reduce their costs by "running full," or whether supplies, particularly native rubber, will be restricted by low prices are questions that only time can answer. Predictions vary from those which say that rubber will climb to 28- and 30-cent levels next year, to those which venture the opinion that prices will drop to 14- and 15-cent figures.

It would be a boon to manufacturers in America to have a stabilized market for a few years. Speculation profits in rubber are never made without the danger of their being followed by losses. With the Rubber Institute functioning to eliminate merchandising evils, a fair degree of stabilization in the crude rubber market would insure a reasonable profit to the rubber manufacturing industry in the coming year.

Chain Store Distribution

THE rapid growth of the large mail order houses, recently accentuated by the opening of large retail branches, is a significant movement to rubber manufacturers. Changing trends in the buying habits of the nation due to better roads and the automobile have brought the mail order companies into the retail field where they are distributing a larger share of the nation's production of rubber goods.

Mail order and other chain stores are selling a larger proportion of the tire output each year. Sales managers, who in the past have looked upon this avenue of distribution as a court of last resort, are wondering about the future. Having adopted the chain store idea, mail order houses are now taking the product of the largest rubber companies in the country where a few years ago they were being supplied by small producers. While it is true that this business is taken at a narrow profit, there are many desirable features about it for the manufacturer.

The mail order houses take the product during the off seasons, enabling plants to run full and keep their overhead down; they pay cash, providing a quick turnover. The individual retail tire dealer, no doubt, has ample grounds to protest this encroachment by the mail order houses but nevertheless, in the age of the chain store idea, it would seem that the mail order concerns, through the chain store system, must be considered a formidable factor in tire marketing.

Sports for All

IN the midst of the football season with the thud of the pigskin resounding in the crisp, October air, our thoughts naturally turn to sports. Sports for the few are generally becoming for the many with the growth of compulsory physical education in secondary schools and colleges.

Aside from the gain to the health of the nation, there has been a distinct gain to the rubber industry. Almost every sport uses rubber in some part of its equipment. Growth in sports of all kinds will continue, and with it the demand for rubber products will keep pace.

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The ideal solvent for rubber and pyroxylin combinations. Samples for test and further information sent on request.

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Montreal, Canada Greenville, S. C.

NEWS of the INDUSTRY

Financial–Business
Building Operations
Personals
New Products

RUBBER ASSOCIATION TO ASK FREIGHT CUT

Reduction in Rates for Shipment of Crude Rubber Is To Be Sought at Hearing Before Members of Inter-State Commerce Commission.

THE Rubber Association of America, through a petition signed by 106 of its manufacturing firm members, has taken the first step in a fight to have the Interstate Commerce Commission change the freight rating on crude rubber from the fourth to the fifth classification. If the request is granted, it will mean a substantial reduction in the cost of shipping rubber by rail and will bring about a considerable saving to rubber manufacturers.

The actual result of the change in classification would be a decrease of 7 cents a hundred pounds in the freight rate for shipment of crude rubber. The present rate is 47 cents a hundred pounds.

Following the filing of the petition at Washington, the next step is for the Commission to set a date for a hearing. The companies involved will then send representatives to appear before the Commission, and it is regarded as certain that the railroads affected will defend their present rates.

Drop in Costs Cited

In their petition the rubber companies point out that operating costs have been reduced in many ways and that tires are now selling at a lower figure than for many years past. Hence, they believe that freight rates should be similarly reduced.

Evidence bearing on the case will be investigated by an examiner for the Interstate Commerce Commission who will report to the Commission which later will go over the evidence. It is generally expected that it will be 18 months or more before a final decision can be reached in the matter.

Most of the railroads affected are on the Atlantic seaboard and are principally those which have connections with Akron. The majority of the leading tire and rubber manufacturers are included among those signing the petition.

To Rebuild Reclaiming Plant

M. M. Mell, owner of the buildings housing the reclaiming plants and warehouse of the Lowenthal Company at Akron which were recently destroyed by fire, has announced that he will rebuild on the same ground. The fire, which was spectacular, caused a damage of more than $50,000 and was caused by spontaneous combustion in a connecting tunnel, according to the Loewenthal Company.

AKRON RUBBER MEN ADDED TO "WHO'S WHO"

During the past two years three Akron rubber company men have gained sufficient fame throughout the country to be included in the 1928-29 edition of "Who's Who in America." They are Harvey S. Firestone, Jr., listed as vice-president of the Firestone Steel Products Company, vice-president and treasurer of the Firestone Plantations Company and director of the Firestone Tire & Rubber Company; Paul W. Litchfield, president of the Goodyear Tire and Rubber Company; and J. D. Tew, president of the B. F. Goodrich Company.

Others already listed in the volume include Harvey S. Firestone, Sr., president of the Firestone Tire & Rubber Company; Frank A. Seiberling, president of the Seiberling Rubber Company; and Jacob Pfeiffer, president of the Miller Rubber Company.

FURTHER PLANS MADE FOR AKRON RUBBER INSTITUTE

More details of the plans now under way for the creation of a rubber chemistry institute and research laboratory at the University of Akron have been announced by Hezzelton E. Simmons, professor of chemistry and secretary of the Rubber Division of the American Chemical Society.

According to Professor Simmons' plan, on which the directors of the university will take action later, Akron will have a research laboratory outfitted with testing machinery such as only the most completely equipped private laboratories in Germany and England now house. There will be mills, calenders, vulcanizers, and all kinds of stress and strain, aging, abrasion and conditioning testing machines. For the testing of fabrics it will have similar machinery, and the building will have its own power plant with high pressure boilers to provide steam for the processes.

Some of the leading authorities of Europe and America who will be invited to participate in the proposed annual Akron University Rubber Institute sessions are Professors Van Rossem and de Vries, of Delft, Holland, Professors Schidrowitz, of England, and Professor Ernst A. Hauser, now at the Massachusetts Institute of Technology.

KELLY-SPRINGFIELD SEEKS MORE CAPITAL

Board of Directors Approves Plan of Offering 700,000 Additional Shares of Common Stock to Retire Bank Loans and Outstanding Notes.

The long expected financing plan of the Kelly-Springfield Tire Company will be placed before the stockholders of the firm on October 13. At that time they will be asked to vote on a proposition to increase the authorized common stock from 500,000 shares of $25 par value to 1,200,000 shares of no par value. The plan to be submitted also calls for liquidation of all current bank loans and retirement of $5,000,000 of 8 per cent notes outstanding.

The directors have approved a plan whereby stockholders will receive one share of no-par common stock for each share of $25 par stock held and be given the right to subscribe pro rata to an additional 700,000 shares of common stock at $21 a share. Under the plan, rights will be offered to stockholders of record October 17 for subscription in the ratio of two shares for every share of no-par stock held.

According to Samuel Woolner, Jr., president, the company has made arrangements for underwriting 100,000 shares of the 700,000 shares included in the offering and the granting to the underwriters of the option to purchase such portion of the remainder as shall not be subscribed for by holders of common stock.

To Make Company Strong

"If the plan is fully consummated," says Mr. Woolner, "and the 700,000 shares are taken up by stockholders and underwriters, the company will be placed in a strong cash position. With the reduction in its indebtedness, including payment of the major portion of its bank indebtedness, thereby made possible, a saving of a very substantial amount in annual interest charges will be accomplished.

"Due in large degree to the drop in the price of crude rubber, the company suffered a substantial loss during the first six months of 1928. Since July of this year the company has been operating profitably."

Dayton Profit for August

The net profit of the Dayton Rubber Manufacturing Company, Dayton, O., for the month of August, before depreciation and taxes, was reported as $141,303.59.

New Firestone Branch

It is reported that the Firestone Tire & Rubber Company is intending to purchase property in Pocatello, Idaho, for the purpose of erecting a distributing branch building there.

GOODYEAR OFFICIALS IN INTER-PLANT CONFERENCE

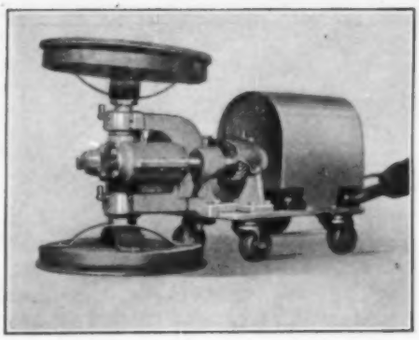
An inter-plant conference at the Akron factories of the Goodyear Tire & Rubber Company opened October 8 and will continue through the week. These conferences were started in 1920 upon the completion of the Goodyear California factory with the idea of keeping the organization as a unified whole instead of in detached units. Every phase of manufacturing is gone over by the visiting factory heads, and ideas and problems are discussed.

The week following will be devoted to the annual sales conference of all Goodyear sales representatives.

"In this way," says President P. W. Litchfield, "the plants have been tied together into a single organization, and opportunity is given for a comprehensive review of the year's progress and for the laying of plans for the year ahead."

Officials of Goodyear plants attending the conference include Superintendent William Urquhart and William Kither of Sydney, Australia; Edward Thomas, superintendent at Los Angeles; Herman Barron, C. J. Rose, R. J. Brady, J. P. Heaney and H. H. Travis of Los Angeles; Superintendent Edward Koken, Harley Allman, L. P. Barrett, M. H. Cryder, C. E. Shoemaker, A. M. Hardy and M. A. Neal, all of the Canadian plants at Bowmanville and Toronto, Ont. W. D. Ladue of Wolverhampton, England, is also present.

Others are C. W. Young, Killingly, Conn.; G. I. Parmenter, Cedartown, Ga.; L. S. Hall, New Bedford, Mass.; and J. P. Goudreault, St. Hyacinthe, Que. These men represent Goodyear's cotton mills.

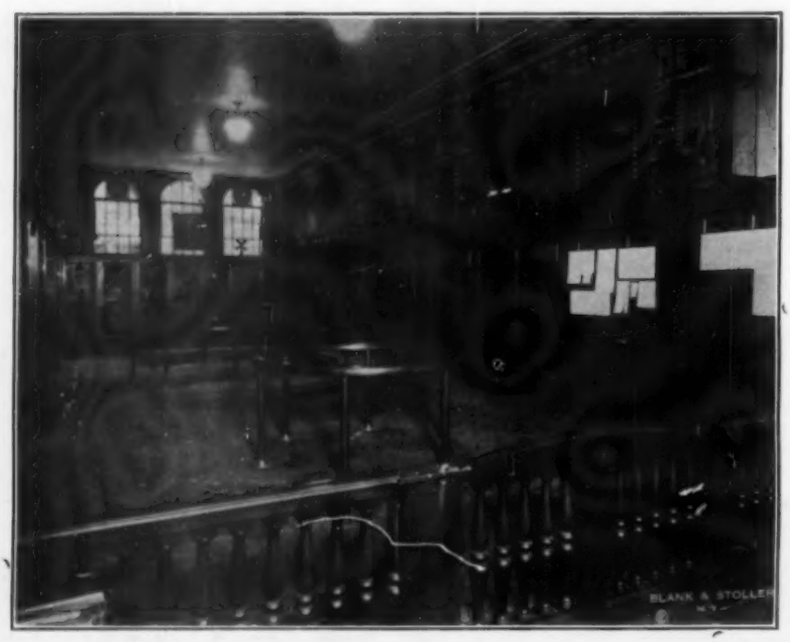


Press Cleaning Machine

A new type of press cleaning machine with dust proof motor guard is the latest development by the Spadone Machine Company, 15 Park Row, New York City, in the line of equipment for rubber manufacturing plants. The machine is small and compact and can be operated by one man. It is so constructed that it can be arranged to clean both the upper and lower platens at one time. There are two adjustable heads resting on springs which have a loose fit on the drive shaft, thus permitting the heads to seek a level plane, making a full surface contact with the platen. These heads are each surfaced with removable discs of special abrasive paper which thoroughly clean without scratching or marring the platens.

The motor and the mechanism driving the heads are mounted on a bed plate which in turn rests on ball bearing casters. The machine is guided over the press platens by means of a long handle. An extension cord which can be attached to a nearby light socket leads from this handle in which is also conveniently located a trigger switch for power control.

Rubber Exchange Adds New Trading Ring



A view of the Rubber Exchange of New York, Inc., showing in the foreground the new trading ring recently installed for the purpose of dealing in the new "BB" contracts covering a slightly lower grade of rubber than that of the "A" contracts.

SEEKS EQUIPMENT FOR RAINCOAT MANUFACTURE

Professor Ing. Comm. Mario Fossati, general secretary of the Society for Promoting National Industries of Italy, was recently in this country seeking information on the methods and equipment necessary for the manufacture of raincoats and raincoat materials for one of the society's members. American manufacturers of rubber machinery may send catalogs and other information to Professor Fossati at Via Rossini, 18, Torino, Italy.

George E. Hall

George E. Hall, president of the Boston Woven Hose & Rubber Company, Boston, Mass., died on the evening of October 2. A portrait and a full obituary of Mr. Hall will appear in the next issue of THE RUBBER AGE.

Charles P. Skinner

Charles P. Skinner, managing director of the Goodyear Tire & Rubber Company plant at Wolverhampton, England, died at his home in Wolverhampton on September 17. Mr. Skinner took the post which he held at the time of his death in 1924.

He first became associated with the Goodyear organization in 1922 when he joined the company as managing director of the plant in Johannesburg, South Africa. Prior to his affiliation with Goodyear, he was in the employ of the Racine Horse Shoe Tire Company of New York City.

He was a native of Boston and a graduate of the University of Iowa. He leaves his widow and two children.

Michael A. Flynn

Michael A. Flynn, former director of labor for the B. F. Goodrich Company, died early in the morning of September 27 at his home in Akron after a heart attack. He had retired from the Goodrich organization three years ago to devote himself to inventions and other interests.

Learning the manufacture of bicycle tires at Revere, Mass., Mr. Flynn came to Akron in 1898 to superintend the production of these tires at the Diamond Rubber Company. Later, when the Diamond company was taken over by Goodrich, he became superintendent of the tire department of the latter.

In 1919 Mr. Flynn was made director of labor at Goodrich and in that position he supervised the employment of thousands of men and women. He originated a tube mold adopted by an Akron rubber company and spent much of his time in improving methods of tire and tube production.

Mr. Flynn is survived by his widow, three children and three grandchildren.

In announcing the death of J. Bonbright Anderson on August 26, THE RUBBER AGE in its issue of September 10 stated that he was president and treasurer of the Anderson Rubber Company of Akron O. The late Mr. Anderson was not an officer of and was never associated in any way with the Anderson Rubber Company which was founded in 1907 by Selden W. Anderson, who still remains president and sole owner of the firm.

W. W. EVANS RESIGNS FROM R. T. VANDERBILT COMPANY

Announcement has been made of the resignation of W. W. Evans as chemical engineer with the R. T. Vanderbilt Company, New York City, effective October 15, to accept a position as director of research of the Ludlow Manufacturing Association, 80 Federal street, Boston, Mass., makers of jute and flax products.

Mr. Evans leaves the rubber industry after 17 years of service in that field, chiefly with the B. F. Goodrich Company and the Philadelphia Rubber Works Company. He went with the R. T. Vanderbilt Company in April, 1927, and has since done extensive research work on the use of anti-oxidants in rubber, oils and soaps.

Joining the Goodrich organization in 1911 as a research chemist, Mr. Evans later became chief chemist of the Philadelphia Rubber Works Company. After two years in reclaiming work, he returned to Goodrich and went to the chemical manufacturing division. In 1917 he was put in charge of the chemical laboratory at the main plant and in 1919 appointed development manager. He later acted as technical superintendent of the mechanical goods department until 1927.

In addition, Mr. Evans has been active in the Rubber Division of the American Chemical Society, acting as chairman in 1920 and serving on several committees. He has read many papers before the meetings of the division.

In his new connection, Mr. Evans will have charge of the research laboratory of the Ludlow concern where he will study the application of chemistry to the processes used in the preparation of flax and jute fibres and the utilization of waste materials.

GOODRICH PLANE VISITS LOS ANGELES AND SOUTH

The Goodrich "Silvertown," the airplane of the B. F. Goodrich Company, was present at the air derby at Los Angeles, Cal., last month, piloted by Cy Caldwell. It returned to Akron on September 25 and, with H. A. Bauman at the controls, flew to Atlanta, Ga., for the annual convention of the National Wholesale Druggists' Association.

A stop was made en route at Cincinnati to pick up K. A. Vogeler, president of the A. Vogeler Drug Company of that city and Mrs. Vogeler as passengers.

Seeks Drying Equipment

J. W. Leech, of the Sutcliffe Ventilating & Drying Company, Ltd., Manchester, England, is in the United States at present investigating domestic unit automatic drying equipment suitable for English rubber factories. His firm is desirous of acting as English representative for such equipment, and local manufacturers wishing to get in touch with Mr. Leech may do so through THE RUBBER AGE.

CATALPO!

THE PURITAN OVER NEW YORK

The new baby dirigible of the Goodyear Tire & Rubber Company gave New Yorkers a thrill when it soared over the big buildings of lower Manhattan after flying there from Akron

RUBBER AND PARAFFINE COMPANIES ARE MERGED

The merger of the Plant Rubber & Asbestos Company with the Paraffine Companies, Inc., has been approved by the board of directors of the latter. Stock of the two companies will be exchanged, subject to the approval of the state corporation commissioner of California. Both firms are located at San Francisco.

The Plant Rubber & Asbestos Company, originally incorporated in 1900, produces pump valves, gaskets, high pressure steam packing, low pressure square spiral packing, and other mechanical rubber goods under several brand names. Sydney L. Plant is president and general sales manager of the firm.

DR. HAUSER ADDRESSES AKRON RUBBER CHEMISTS

Dr. E. A. Hauser, professor of industrial chemistry at the Massachusetts Institute of Technology, whose new theory of the structure of rubber is receiving much attention from rubber chemists, spoke before members of the Akron section of the American Chemical Society on September 21 at the Firestone Clubhouse.

The subject of Dr. Hauser's address was "The Colloidal Chemistry of Rubber." The meeting, which inaugurated the first dinner program of the season for the Akron group, was presided over by H. F. Palmer, of the Xylos Rubber Company, as chairman.

SAMSON SALES OFFICE IS MOVED FROM AKRON

The transfer of the Akron sales office of the Samson Rubber Company to Cincinnati was announced on September 18 by W. W. Drum, general sales manager. At the same time announcement was made of the resignation of C. C. Prather, eastern sales manager, A. C. Fisher, assistant sales manager, and A. D. Brown, Jr., Akron district manager, all of whom had been identified with the Akron office of the company.

The move was said to have been made to bring the sales and eastern warehouse organizations of the firm together, the shipping offices having been located in Cincinnati for some time. Eastern district sales are to be handled from Los Angeles, the main office of the company, in the future, according to Mr. Drum.

Mr. Prather had been eastern sales manager for Samson since April, joining that company from the India Tire & Rubber Company. Before his connection with India, he was for 10 years with the Goodyear Tire & Rubber Company. Messrs. Bowen and Fisher were also with India before going with Samson.

CATALPO!

Timely Financial News

FISK RUBBER OMITS ITS PREFERRED DIVIDENDS

The Fisk Rubber Company has omitted the quarterly dividends of $1.75 due at the end of September on the 7 per cent first preferred, 7 per cent convertible first preferred and the 7 per cent second preferred stocks. The action of the directors in passing the preferred dividends was in view of the reduction in surplus due to losses sustained by the drop in crude rubber prices in the first six months of 1928, caused by the decision of the British to abolish the Stevenson Act restrictions on November 1. The Fisk company sustained a net loss of close to $5,000,000 after write-downs of crude rubber inventories for the first half of the year, and, in view of this fact, the directors wished to conserve the present strong financial position of the company.

The plants of the company are now being operated at close to capacity and from present indications production will continue at the same rate next year.

GOODRICH COMPANY MUST PAY $216,433 IN TAXES

The B. F. Goodrich Rubber Company must pay the government the sum of $216,433.77 as interest on income and property taxes for a part of 1918, following a judgment rendered September 18 by Federal Judge Paul Jones after government attorneys and counsel for the rubber company had reached an agreement on settlement.

The government brought suit to collect $623,581 as interest on 1918 taxes, the payment of which had been delayed by court abatements until 1926, but agreed to settle for the lesser figure.

Rubber Plant is Sold

The plant of the United & Globe Rubber Company, Trenton, N. J., was sold on September 7 to satisfy a claim for unpaid taxes amounting to $3,000. There were no buyers, and the plant was taken over by the City of Trenton. The company formerly produced "Globe" tires and tubes and other rubber products.

Reopen Goodyear Exchange

The Goodyear Tire & Rubber Company is notifying stockholders that the opportunity to exchange old preferred shares for first preferred stock has been reopened. The basis of exchange is one share of old preferred for 1¼ shares of first preferred.

CATALPO!

PAGE'S SPECULATION BOOSTS TIRE STOCK

According to newspaper reports, a 13-year-old New York Stock Exchange page last month walked up to the selling clerk of a broker's office and asked for 50 shares of Norwalk Tire & Rubber Company common, buying them outright with his savings of $125. News of his purchase spread, and others, believing that he must have had an authoritative tip, followed his course and bought heavily in the stock, causing it to rise from 2½ to its high of the year at 7½.

The youngster sold his shares near the peak, making a clear profit of nearly $250. When asked later where he had received the tip, he replied, "I had no tip. I just wanted to buy the most shares I could for my money, and Norwalk at 2½ was the lowest priced stock."

Manhattan Rubber Dividend

The board of directors of the Manhattan Rubber Manufacturing Company, Passaic, N. J., has declared the regular dividend of 62½ cents a share and an extra dividend of 50 cents a share. The dividends are payable October 31 to stockholders of record on October 15.

Firestone Stock Dividends

The Firestone Tire & Rubber Company has declared the regular quarterly dividend of 1½ per cent on the 6 per cent preferred stock, payable October 15 to stockholders of record as of October 1. In addition, a dividend of $2 a share on the common stock of the company has been declared, payable October 20 to stockholders of record as of October 10.

Late Stock Prices

	Last Price		—1928—	
	Oct. 4	Sept. 20	High	Low
Ajax	9⅜	8¼	14⅜	7½
Falls	8¼	8½	13	4½
Faultless	32½	30½	39¾	30
Firestone	170	177¾	232	165
do. 6 % pfd.	110	108½	112	109
Fisk	10⅝	11⅜	17¾	8⅞
do. 1st pfd.	57½	63	91½	55¾
General	187	170	190	165
do. pfd.	97½	98½	111	98
Goodrich	81¼	82⅛	99⅜	68½
do. pfd.	110⅛	110¾	115⅝	109½
Goodyear Com.	70¾	67½	74⅞	45⅛
do. pr. pfd.	99	97½	99½	92½
Hood	29	30⅝	43	25
India	41½	55	57¾	16
Intercontinental	9½	10½	21⅜	8⅛
Kelly Springfield	23½	22	27⅜	15
do. 1st pfd.	81⅞	70	87	58
Lee	20¾	19½	24½	17¼
Miller	—	22½	27	18⅞
do. pfd.	80¾	85½	97½	70
Mohawk	195	224	224	29¾
do. pfd.	93	93	95	55
Norwalk	5¼	5⅜	7½	2½
do. pfd.	48	48	48	33¾
Seiberling	49⅞	48⅜	52¼	35
do. pfd.	103⅜	105½	107½	102
U. S. Rubber	38⅝	38⅞	63¼	27
do. pfd.	66¾	69	109⅜	55

NEW HIGH LEVELS FOR RUBBER COMPANY STOCKS

In a fairly active fortnight of trading, Goodyear and Seiberling common stocks rose to new high levels for the year, the former reaching 74⅞ and the latter 52¼. Both receded slightly toward the end of the period on profit taking and in the general October 1 decline due to high call money rates.

Mohawk and India, always among the most active issues, fell back considerably during the two weeks. Mohawk common dropped from 224 to 195, while India slumped 13½ points down to 41½. Stocks which registered new low levels during the period were Firestone common at 165 and Fisk first preferred at 55¾.

The Fisk Rubber first preferred convertible showed the anomaly of selling several points below the straight Fisk first preferred, although it is on a par with the latter in respect to rights and should sell at a premium due to the added attraction of convertibility into common.

SEIBERLING COMPANY TO SEEK EXCHANGE LISTING

The Seiberling Rubber Company has made application to the board of directors of the New York Stock Exchange to have its common stock listed on that market, according to a statement made by C. W. Seiberling, vice-president of the company. It will, however, probably take until the end of October before the application can be formally acted upon.

By his statement, Mr. Seiberling confirmed the rumors that the stock was being groomed for the New York exchange. It is now listed on the Cleveland Stock Exchange and on the New York Curb Market.

LISTS BALDWIN STOCK ON CHICAGO EXCHANGE

Application is being made to list the issues of the Baldwin Rubber Company, Pontiac, Mich., on the Chicago Stock Exchange. The company has recently reported net profits of $149,365 for the first seven months of this year after all charges, including depreciation and federal taxes.

This is equivalent to $2.98 a share on the class "A" stock. After allowance for class "A" dividends at the rate of $1.50 per share per annum, balance is equivalent to $1.06 a share on the class "B." The net of the company for July was nearly double that of a year ago.

C. P. Hall Co. Incorporates

Incorporation of the C. P. Hall Company, Akron, makers of rubber chemicals, was asked September 27 in a petition to the secretary of state of Ohio by Ann Peterson, Frances G. Hines and Paul G. Weick. Capital was listed as 250 shares of no par value stock.

Names in the News

CLIFTON C. SLUSSER, vice-president and factory manager of the Goodyear Tire & Rubber Company, spent several days in the latter part of September visiting the company's Los Angeles plant. He conferred with E. J. THOMAS, plant superintendent, on the expansion of the Coast plant to a daily output of 12,500 tires.

T. F. KUCKLEMAN of Akron addressed the Kiwanis Club of Mansfield, O., at a luncheon meeting last month, speaking on the future development expected for the rubber industry. He declared that many new uses would be found for rubber and stated that a rubber composition board similar to beaver board was already about to be put on the market.

ROGER H. TAYLOR, pneumatic tire salesman for the Firestone Tire & Rubber Company, is one of Akron's best known private airplane pilots. Owning his own biplane, he frequently makes trips about Ohio and Pennsylvania, and makes flying his chief

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WILLIAM H. KOONS, New Jersey representative for the Thermoid Rubber Company, Trenton, N. J., and MISS BLYTHE DEVINE, also of Trenton, were married last month and left for a trip to Canada.

C. A. Yoos has been appointed middle west representative for the Murray Rubber Company, Trenton, N. J. He will make his headquarters at the offices of the company at 601 West Randolph street, Chicago.

H. A. DORNSEIF, general sales manager of the Murray Rubber Company, spent several weeks recently on a business trip along the Pacific Coast.

W. EDWIN PALMER, secretary of the Seiberling Rubber Company and one of the three 33rd degree Masons in Akron, was present at Atlantic City September 18 for the occasion of the conferring of a similar honor upon WILLIAM B. BALDWIN, former Akron postmaster and editorial worker on the Akron *Beacon Journal*.

V. D. LIDYARD has resigned his position with the advertising department of the Firestone Tire & Rubber Company to become affiliated with the Brown Advertising Agency, Akron. He has had 10 years' experience in advertising and was formerly editor of the Herald Publishing Company and connected with the Goodyear Tire & Rubber Company.

P. H. HART, treasurer of the Goodyear Tire & Rubber Company, is an active worker for the newly formed Moderation League of Ohio, a political organization instituted for the purpose of advocating changes in the Eighteenth Amendment.

P. W. LITCHFIELD, president of the Goodyear Tire & Rubber Company, was host on September 23 to the executive committee of Region Four, Boy Scouts of America, at the City Club of Akron. Mr. Litchfield is Akron representative of the committee.

HARVEY FIRESTONE, JR., vice-president of the Firestone Plantations Company, sailed September 27 on the *Mauretania* for Europe.

FRANK MARSHALL of the Seiberling Rubber Company acted as host to members of the Barberton Kiwanis Club on September 19, conducting them through the factory buildings of the rubber company. Mr. Marshall, who is president of the club, was assisted in receiving the guests by FRANK KOVACS and IRA CALVIN of the Seiberling organization.

FREDERICK R. SAYEN, secretary of the Mercer Rubber Company, Hamilton Square, N. J., has returned from an extended business and pleasure trip through Europe.

C. A. STILLMAN, vice-president of the Goodyear Tire & Rubber Company, is chairman of the Citizens' Financial Advisory Committee which is working with the Akron Chamber of Commerce on the city charter tax limitation amendment.

GEORGE T. PARSONS, 17-year-old office boy of the Miller Rubber Company, defeated all the old-timers of the organization in the sixth annual golf tournament, winning the Jacob Pfeiffer Trophy Cup with a score of 78.

G. E. BROWN, of the engineering department of the Goodyear Tire & Rubber Company, and MISS MARIE C. GRIEME of Cleveland were married last month. They left Akron to spend a week in New York.

H. H. KELLY, American automotive trade commissioner for Europe, tendered his resignation to the Department of Commerce on September 25 in order to become European representative of an American automotive manufacturer. Mr. Kelly, whose resignation will not become effective until November 1, has also resigned as president of the American Automotive Club of Europe.

DAN M. BELL, manufacturers' representative of Dallas, Tex., will in the future represent the Ken-Wel Sporting Goods Company, Utica, N. Y., in Texas, Arkansas, Louisiana and Oklahoma. He will call on the jobbing trade with the Ken-Wel line of rubber-centered baseballs and other athletic equipment.

DR. KARL ARNSTEIN, vice-president of the Goodyear Zeppelin Corporation, was a guest of honor at a special luncheon held by the Cleveland Club at Wade Park Manor on September 25.

EDWARD J. SAMUEL, merchandising manager of the Fisk Tire Company, Inc., will read a paper at the 11th annual convention of the Direct Mail Advertising Association to be held in Philadelphia from October 17 to 19. His subject will be "Direct Mail—Every Phase of Advertising Contributes to Its Success."

ALBERT E. PENFOLD, F. I. R. I., has terminated his engagement with the Dunlop Rubber Company, Ltd., of England, to engage in research on new principles in the manufacture of golf balls, athletic equipment and other rubber goods. His work in golf ball design and production methods is well known.

FRANK A. ROLLA, former commissioner's clerk for Mahoning County and senior in the law college of Youngstown Y. M. C. A. university, has been appointed to the cost accounting department of the B. F. Goodrich Company.

ALBERT PIRELLI, head of the Pirelli Rubber Company of Italy, as president of the International Chamber of Commerce, has appointed a committee of well known business men, specialists in Chinese economic and financial affairs, to prepare a report on the Chinese question for the November meeting of the Council of the Chamber.

F. J. KITT, of the Firestone Steel Products Company, was selected by the Newcastle *Weekly Chronicle*, an English newspaper, as No. 6 in its series of articles entitled "Pitman Poets of the North." His reputation as an author and poet is shown by the fact that all the previous selections were well known poets of several generations back.

N. E. HORTON has been appointed sales promotion manager of the Seiberling Rubber Company of Canada, Ltd. Originally advertising manager for Mercury Mills, Ltd., Mr. Horton for many years held a responsible position with the Sherwin-Williams Company of Canada and after the war acted for four years as branch manager for the Glidden Company.

H. G. WEILERT, of the Firestone Tire & Rubber Company export department, sailed September 15 for Columbia and Venezuela, to take up his new duties as representative of the company in those South American countries.

V. R. JACOBS, assistant sales manager of the Goodyear Tire & Rubber Company, spoke to members of the Mansfield Rotary Club on September 25 on the progress of the United States in aeronautics. He described the new dirigibles that the Goodyear Zeppelin Corporation is to build for the government.

HOWARD F. SMITH, western sales manager of the General Tire & Rubber Company, is leaving Akron to establish the Howard F. Smith Company, distributors of General tires in San Francisco.

Rubber News Around the World

DUTCH GROWERS SEEK COOPERATIVE POLICY

Termination of Stevenson Act Provisions Makes Netherlands Planters Desirous of Co-operating in Some Measure for Rubber Price Stabilization.

PROMINENT among the various factors that will control the rubber market after the cessation of restriction is the attitude of producers and large American consumers toward each other. The future of the American rubber pool is in doubt but it is appreciated in London that the Rubber Exchange of New York constitutes a well-organized and well-supported force to which European producers have nothing similar.

Attempts to form such a producers' organization have thus far been abortive, according to the report of the committee appointed several months ago by Dutch producers for the protection of the rubber growers' interests. This committee will shortly hold a general meeting of the International Association of Rubber Growers in the Netherlands East Indies to decide on the policy to be followed in the future, this step having been necessitated by the fact that the committee itself divided over the question of undertaking negotiations with America.

In London it is believed that American interests may not desire to make arrangements with a European group strong enough to prevent actions by outsiders adverse to their efforts to stabilize the market. Some interpret the American attitude as an effective method of putting a stop to any negotiations.

When the Dutch committee tried to come to an understanding with the British producers, they could secure only an expression of readiness to collaborate without any practical results. British producers refused to have terms dictated to them by a group of less importance.

The committee fared similarly in its efforts with the Franco-Belgian planters. The latter, as well as many British growers, were of the opinion that collaboration must, above all, lead to the liberation of the market from surplus rubber, estimated by them at about 10 per cent of the production. Cessation of tapping for a period of two months appears to them the most suitable remedy.

RUBBER TIRE SHOES USED AT SALONIKA

Discarded American automobile tires that once were dispatched to rubber salvaging plants now are being made into shoes for peasants of Salonika, Greece. It is reported that 50,000 casings are imported annually to meet the demand. Each tire makes three shoes.

Salonika is famous as a city of refuge, a fact that may account for its enormous peasant population to whom the new style of footgear appears as a highly prized luxury.

While the idea of co-operation and restriction now seems desirable to most Dutch producers, the view that no regulation is best still has not died out. The president of the Javasche Bank, for example, looks for a solution from increased consumption brought about by the decline in the cost price of rubber. Other opinion is that any further drop in rubber prices will wipe out native planters entirely.

The majority of the members of the Dutch committee are of the belief that co-operation and later, as a possible consequence thereof, a uniform procedure against American interests and other consumers is likely only when an agreement has been reached on the question of restricting production. So long as producers disagree, it is the general opinion abroad that New York, and not London, will rule the market.

Rubber Water Suit

A novel suit made entirely of rubber which practically permits the wearer to walk in deep water has been invented by a member of the fire department of Berlin, Germany. In trying the device out recently, the inventor made his way successfully across the Spree River.

Malayan Estates Combine

The latest step toward the grouping of the smaller units of the rubber plantation industry has taken place in the amalgamation of two members of the Kennaway, Neame group, the Amherst and the St. Ives Estates. The total planted area of the two estates will be 1,969 acres, all of which is mature except 454 acres of the Amherst Company. The capital of the combined companies will be slightly under $500,000.

BRITAIN TO CONSTRUCT SINGAPORE NAVAL BASE

The Admiralty Office of London has announced that the contract has been let for the construction of the great new naval base at Singapore to cost about £7,750,000. Projected in 1921, then delayed following the Washington naval conference, the Singapore plan was temporarily abandoned by the MacDonald government only to be brought up again under the Baldwin ministry.

The plans call for a dry dock to cost £1,000,000 which will accommodate the largest ship afloat. The government of the Straits Settlements has given nearly 3,000 acres needed for the base. The government of the Federated Malay States has contributed £2,000,000 toward the project.

DR. SOMERVILLE SPEAKS BEFORE I. R. I. SECTIONS

At the meeting of the London section of the Institution of the Rubber Industry on October 1, Dr. A. A. Somerville, of the R. T. Vanderbilt Company, New York City, spoke on "The Effect of Temperature on the Stress-Strain Properties of Vulcanized Rubber." He will repeat his talk on October 11 before the members of the Birmingham and district section at the Grand Hotel, Birmingham, England.

Rubber Companies Prosperous

Advices to California and other stockholders of the Pahang Rubber Company and the Tanjong Olak Plantation Company recently told of a report to the directors by Guy Rankin, managing director, in which he declared conditions to be excellent. Tanjong is producing enough rubber to pay expenses and when the upturn in the rubber market comes, there will be certain profits, according to Rankin. The Pahang Company was reported in first-class shape both physically and financially. Stock of both concerns is listed on the San Francisco Curb.

CATALPO!

INTERNATIONAL PULP CO., *41 Park Row, New York, N. Y.*
SOLE PRODUCERS OF PURE **ASBESTINE** SPECIALLY PREPARED FOR USE IN RUBBER
Covered and Protected by Letters Patent Registered at U. S. Patent Office, Washington, D. C.
LIBERAL WORKING SAMPLE FURNISHED FREE

Rubber Goods and Specialties

Stocking Splash Protectors

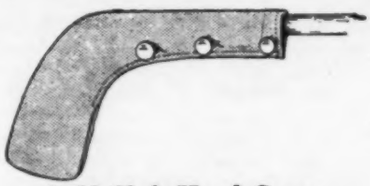
To prevent ladies from splashing their stockings in wet weather, these protectors have been devised and put on the market by Sorpex, Ltd., 1 Albert street, Birmingham, England. The device consists of rubber caps to slip over the heels of ladies' street shoes,

which they grip securely. Sponge rubber top pieces, which are fitted to the tread surface, act as pads preventing jar to the heel on impact with the pavement. When the heel is lifted, even from water, the sponge rubber absorbs all the moisture and prevents any mud or water from being thrown upwards. These "Splash-Savers," as they are called, are furnished in four colors—black, gray, biscuit and tan—in six sizes for Louis, Cuban, medium-flat and flat heels. When not in use, they can be removed and packed in a neat rubber-lined case which can be carried in a handbag.

Golf Ball Cleaner

For the purpose of keeping a golfer's ball clean so that it will be easily visible in play, the St. Helens Cable & Rubber Company, Ltd., Slough, England, has designed this handy and efficient cleaner. A water cham-

ber in the rubber walls of the cup has been devised to suck up enough water on immersion to last for several weeks. On compression of the ball onto the sponge, sufficient water escapes to saturate it thoroughly and on release of the pressure, the superfluous water is sucked back into the reservoir. These cleaners are molded with an eyeletted tab so that they can easily be attached by a string to a club or the golf bag or hung onto a button of the golfer's garments.



Golf Club Head Cover

A waterproof cover, designed to protect the head of a golf club against rust or other deterioration due to dampness, is offered to the sporting world by the North British Rubber Company, Ltd., of Edinburgh, Scotland, and London, England. Many expensive golf clubs are ruined by exposure to the elements, and it is the intention of the makers of these covers to offer a means for preventing this loss. The covers are of rubberized fabric and are perfectly waterproof

Rubber Headed Nails

Made for the purpose of deadening noise and cushioning the contact of two wooden

surfaces, these rubber headed nails are of a good quality soft rubber on a broad wholeheaded nail. They are intended to serve as bumpers on pianos, closet seats, and to receive the thrust of drawers while at the same time preventing the marring of the surface to which they are attached. Because of the construction of these nail bumpers, the rubber head will not separate from the metal tack itself. The manufacturer is the Elastic Tip Company, 370 Atlantic avenue, Boston, Mass.

Elastic Wristband

Said to give exactly the right degree of pressure without any adjustment except turning the band on the wrist, this adjustable elastic wristband is offered by the Fitsrite Products Company, 23 East 22nd Street, New York City. The "Fitsrite" band is also claimed to be ventilating, washable and non-irritating. A single size is made to fit all wrists, and the bands are made in three

colors and white. The manufacturer packs these wristbands in individual cartons to be displayed in an attractive counter container.

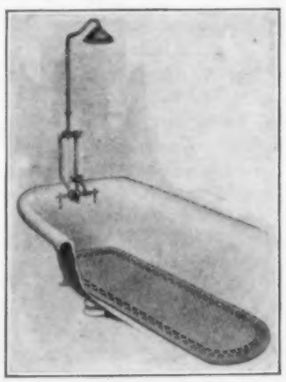
Waterproof Boot and Gaiter

A completely waterproof boot and gaiter combined has been introduced by the Dominion Rubber Company of Canada. Called the "Highboy" Gaiter, it is made of embossed rubber of either reptile or tweed design in two colors—soft brown or gray. These

boots are of high grade rubber and, being very pliable and elastic, fit closely to the leg, thus providing adequate protection for the foot and stockings. The lining is of stockinette, which prevents any condensation during wear. They are fitted with easily adjustable fasteners which enable them to be put on or taken off quickly.

Bath Tub Mats

To make bath tubs safe against the possibility of slipping, these mats are being offered by the New York Belting & Packing Company, Inc., 91 Chambers street, New York City. Smooth porcelain and enameled tubs have often proved a cause of serious



accident, particularly to the aged and infirm, but these mats are claimed to make the smoothest tub safe. Made of white rubber with slightly roughened finish on both sides to make them non-slipping and velvety to the touch, they are impervious to hot water. The manufacturer carries bath tub mats of this type in stock in a 12 by 36 inch size and also furnishes special sizes to order.

Current Crude Rubber Items

RUBBER EXCHANGE IS MARKED BY INACTIVITY

Prices Remain Firm During Fortnight But Average of Daily Sales Falls Off One-Third from That of Preceding Period.

FIRMER cables and smaller shipments from Malaya than anticipated for September combined with the August 31 census figures which showed an actual decrease of stocks on estates in the Far East, resulted in the price of crude rubber holding firm throughout the past fortnight. After two days at 17.80 cents, the spot price on the Rubber Exchange of New York, Inc., remained steadily throughout the following 10 trading days between 18.20 and 18.40, closing at the latter figure.

The average number of daily sales during the fortnight, however, was 125 contracts less than during the previous two weeks, a decline of practically one-third, and there was no sign of a pick-up in activity at the end of the period. What activity there was came from liquidation by commission houses and dealers, some support emanating from certain consuming interests who on October 1 purchased in one commitment 125 lots of December. This is the largest individual transaction that has taken place on the exchange for some time, if not for all time.

The reported activity for crude in the actual market developed a fair demand from various quarters at the end of the period, but most of the larger factors of the trade appeared to be remaining in the background. Operations in the main were a bit mixed and confined to commission houses and locals within the narrow trading range mentioned. The December position, however, finished at the high point of 18.60 which it has not attained in more than a month.

The table below indicates the daily fluctuations in prices on the exchange and the daily volume of sales.

The Joseph Stokes Rubber Company, Trenton, N. J., has erected a new factory plant 100 by 96 feet in size and will shortly build a new machine shop to take care of its increased business. The company, which manufactured hard rubber goods exclusively, is now operating 24 hours a day to handle its orders.

NICARAGUA DESIRES RUBBER PLANTATION

The Chamber of Commerce, Industry and Agriculture of Leon, Nicaragua, a city of 45,000 inhabitants, has sent an invitation to Henry Ford to establish rubber plantations on a large scale in that part of the country. The action of the chamber followed the announcements of Ford's rubber development planned for Brazil.

The invitation stresses the fact that Nicaragua is closer to the United States than Brazil and that the proposed construction of a Nicaraguan canal promises important commercial developments in the country. Rubber once constituted a leading source of income for Nicaragua, but exports from that country declined from 456 tons in 1900 to less than 4 tons in 1922.

RUBBER PRICES TO RISE DECLARES DUTCH BROKER

That the price of crude rubber is bound to rise during the early part of next year is the belief of Martin M. Mallard, Dutch rubber broker of Amsterdam, Holland, who is visiting in Akron. "I believe rubber will go up to at least 25 cents a pound," he says.

"First," Mr. Mallard claims, "there will be a greater consumption. Second, production has been greatly curtailed because of the present low prices, especially among the Dutch growers. They will start cultivating again when the price goes up, but they make little or no profit the way things stand now. They exported 80,000 tons of rubber last year; this year the total will be 50,000."

Asked what was the first force which ended British restriction, Mr. Mallard replied, "I believe that Herbert Hoover's plea to use more reclaimed rubber opened the eyes of the British to the bad situation they were creating."

As the result of a recently completed scientific survey of Melville Island, off the coast of the Northern Territory, Australia, it is reported that the agricultural possibilities include rubber growing.

RUBBER EXCHANGE WILL DEFER NEW CREDIT RULE

Efforts to limit the margin of credit which members of the Rubber Exchange of New York, Inc., may extend to customers have been temporarily postponed. A measure to this end was adopted by the board of governors last June and was to have become effective October 1, but the governors at a meeting September 27 rescinded the ruling.

The measure has instead been incorporated into a proposed by-law and will be submitted to a vote at a general meeting of the membership on November 1. If adopted at that time, it will go into effect January 1, 1929. There has been, however, some opposition to the regulation on the ground that it would work a hardship upon certain houses and individual traders striving to build up a clientele in crude rubber trading. The protesting members urge that the machinery of the clearing house is according ample protection to both member and customer in day to day dealings.

The resolution which will be offered on November 1 reads as follows: "The extension of credit or credits in excess of $1,000 (exclusive of commissions) to a customer, whether a member or a non-member, in connection with the purchase and/or sale of rubber on The Rubber Exchange is declared to be an act detrimental to the best interests of the Exchange and is hereby prohibited. Any member knowingly violating the provisions of this by-law shall be subject to suspension or expulsion under section 43 of the by-laws."

An identical regulation has been incorporated in the commission law rules of the newly-formed National Raw Silk Exchange.

Rubber Exchange Meetings

The annual meeting of the members of the Rubber Exchange of New York, Inc, was held on the afternoon of October 9. The Board of Governors presented a general statement of the affairs and finances of the exchange, and the annual dues to be levied upon memberships for 1929 were fixed. The annual election of officers and governors for next year will be held on October 16 with the polls open from 11 A. M. to 3 P. M.

The first house-to-house telephone connections from Bandoeng, Java, to The Hague were effected last month. This follows the establishment of telephone communication between Holland and India and is expected to be important in the operation of rubber plantations in the Netherlands East Indies.

Closing Prices on Rubber Exchange of New York, Inc.

FROM SEPTEMBER 21 TO OCTOBER 4, 1928

		Spot	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Sales*
Sept.	21	17.80	17.90	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.20	18.20	18.20	——	519
	22	17.80	17.90	18.00	18.00	18.00	18.00	18.00	18.00	18.10	18.10	18.20	18.20	——	55
	24	18.20	18.10	18.20	18.20	18.20	18.20	18.30	18.30	18.40	18.40	18.40	18.50	——	247
	25	18.30	18.20	18.30	18.40	18.20	18.30	18.40	18.40	18.50	18.50	18.50	18.50	——	491
	26	18.40	18.30	18.30	18.30	18.30	18.30	18.40	18.50	18.50	18.50	18.50	18.50	——	401
	27	18.30	18.20	18.30	18.30	18.30	18.30	18.30	18.30	18.30	18.40	18.40	18.50	——	245
	28	18.20	18.10	18.20	18.30	18.10	18.20	18.20	18.30	18.40	18.40	18.30	18.50	——	150
	29	18.20	18.10	18.20	18.30	18.20	18.20	18.20	18.30	18.40	18.40	18.40	18.40	——	11
Oct.	1	18.40	18.20	18.30	18.40	18.20	18.30	18.40	18.50	18.50	18.60	18.60	18.60	18.70	313
	2	18.30	18.20	18.20	18.40	18.30	18.40	18.40	18.50	18.50	18.50	18.50	18.50	18.60	255
	3	18.30	18.30	18.20	18.40	18.20	18.30	18.30	18.40	18.40	18.50	18.60	18.60	18.70	157
	4	18.40	18.30	18.40	18.60	18.40	18.40	18.40	18.50	18.60	18.60	18.60	18.70	18.70	292

*In lots of 2½ tons each

CATALPO!

DE VILBISS COMPANY TO BUILD OWN RUBBER PLANT

Contract for a new factory building to cost $40,000 has just been let by the De Vilbiss Company, Toledo, O., for the purpose of housing its own rubber manufacturing plant. The new structure will be located within the area of the present main factories of the company.

The De Vilbiss Company began experimental development of handling its own rubber about two years ago, and the operations were so successful that practically all of these products are made at the main plant in Toledo from the crude rubber. The company specializes in atomizers having rubber bulbs.

GENERAL TIRE MANAGERS AT AKRON CONFERENCE

About 300 branch managers and sales representatives of the General Tire & Rubber Company, including men from Alaska, South America and foreign countries, gathered in Akron during the last week of September for the annual fall sales conference of the organization. Conference activities were in charge of Sam Poor, general sales manager, and Ben Heer, assistant sales manager.

New advertising plans, new sales ideas and new General tire lines were outlined for the men by William O'Neil, president of the company; W. E. Fouse, vice-president and assistant treasurer; and C. J. Jahant, vice-president and factory manager. President O'Neil declared that 1928 will be the greatest year in the history of the company.

Scranton Men Visit Akron

A party of 125 business men of Scranton, Pa., toured Akron and inspected several of the rubber factories on September 27 under the auspices of the Scranton and Akron Chambers of Commerce. At a dinner at the Portage Hotel, C. W. Seiberling, vice-president of the Seiberling Rubber Company, spoke on the subject of civic and municipal improvements in the city.

SEIBERLING IS INJURED IN AUTOMOBILE ACCIDENT

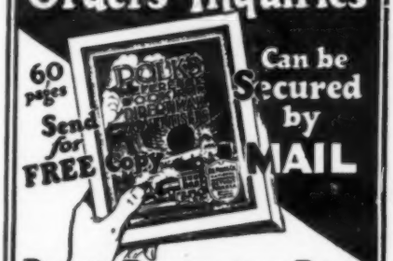
F. A. Seiberling, president of the Seiberling Rubber Company, narrowly escaped serious injury on the afternoon of September 19 when his automobile skidded off the road and overturned near Wadsworth, O. Mr. Seiberling, who was at the wheel when the accident occurred, was badly shaken and suffered bruises and minor lacerations, but was able to be at his office the day following.

The accident happened after a shower that made the road slippery. The car skidded so suddenly that Mr. Seiberling was unable to straighten it out before it plunged over a bank on the side of the road.

Oakland Fire Hose Contract

The City of Oakland, Cal., has ordered 12,000 feet of double jacket fire hose from the Pioneer Rubber Mills, San Francisco. C. M. Bliven, manager of engineering sales for the Pioneer Rubber Mills, handled the sale and says that Pioneer fire hose was selected from a large list of bidders because of the service record it has made in municipal fire departments through the United States.

Orders-Inquiries



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Gives counts and prices on over 8,000 different lines of business. No matter what your business, in this book you will find the number of your prospective customers listed.
Valuable information is also given as to how you can use the mails to secure orders and inquiries for your products or services.

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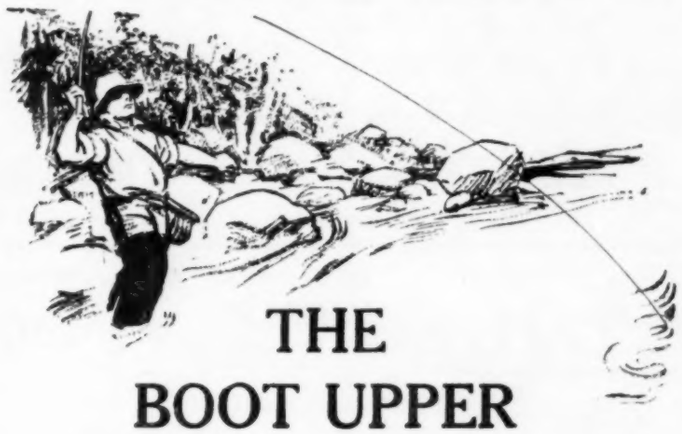
IT PAYS TO MICRONIZE



THE BOOT UPPER

ALONG with flexibility and sound ageing properties the modern wearer of quality rubber boots and heavy rubbers demands *Resistance to the Stubbing of Rocks and Bumps; Immunity from the Attack of Oil and Chemicals; and that General Toughness and Endurance which are obtainable only through the Liberal Incorporation in the Upper Compound of*

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Whenever you are in need of good rubber equipment get our list of machinery first. We are sure to have just what you want at the lowest prices.

We also Buy and Sell Surplus Stocks of fabrics, liners, rubber, manufactured rubber products. Let us quote you on your overstocks.

Wire,
Phone
or
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Your
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Heater Presses
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The Hunter Process
in
The Carrier Ejector System Dryer

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Bunny Baby Pants
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Pure Rubber Sheets
Rubber Bibs
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Randprint Rubber
SHEET GUM cut to pattern for manufacturers

"They Last Longer"

Made by
RAND RUBBER COMPANY, Inc.
Formerly Brooklyn Shield & Rubber Co., BROOKLYN, N. Y.

EMBOSSING CALENDERS

For Artificial Leather, Oil Cloth, Carriage and Automobile Covers

DRYING MACHINES

with Copper or tinned iron Cylinders for Cotton Ducks, Drills and Sheetings

The Textile-Finishing Machinery Co.
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Perfect Beads

Entire freedom from bead trouble in the construction of straight side tires is assured by the use of either National "(Patent)" High Tensile Strength, Flat Woven, Bead Braid on our new (Pratt Patent) Bead Cables. These cables, made to dimensions specified, have seven strands, yet only one piece of wire is used without soldered, welded or brazed joint.

Write for working samples of either National flat braid or Pratt cables (no charge to tire manufacturers) and full information as to our products and service.

Our engineering department tests beads and furnishes complete confidential reports as to their stretch, set and bursting point, without charge. Inquiries solicited regarding this special service.

National Standard Company
Niles, Michigan

Est. 1900 Inc. 1919

THE KUHLKE MACHINE CO.

Formerly Jones & Kuhlke

Automobile Tire Molds and Cores

GENERAL MACHINE WORK

Akron, Ohio

WILLOUGHBY RUBBER FIRM TO MANUFACTURE TIRES

Plans were announced last month for the incorporation of the Willoughby Rubber Corporation with a capital of $250,000 to manufacture automobile tires of all popular standard sizes at Willoughby, O., and to market them through the mail order plan. R. W. Johns, for 18 years connected with the Mansfield Tire & Rubber Company as office manager and as assistant treasurer of the Columbia Tire & Rubber Company, a Mansfield subsidiary, is promoting the new firm in company with local business men and outside interests.

When a location is definitely chosen, the corporation will equip a plant of about 20,000 square feet of floor space, capable of turning out 200 tires daily or twice that number by working three 8-hour shifts. It is planned to start with a production of about 25 tires a day and to increase this in four months to 125 casings daily.

Mr. Johns, who has been at Willoughby since March working on the project, announced that a force of skilled rubber men with 15 to 27 years of experience will be employed in technical positions and that the chief executives will be residents of the town.

Pioneer Factory is Busy

The factory of the Pioneer Rubber Company, Tiffin, O., makers of surgeons' gloves and toy ballons, is operating day and night shifts. Because of the recent fire in the company's Sandusky plant, a double burden is falling on the factory near Tiffin.

The Philadelphia Rubber Works Company

Manufacturer of

RECLAIMED RUBBER

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250 West 57th St., New York City

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TIRE FACTORY FOR SALE

Capacity 2,000 tires per day; located in East; design, equipment, and condition excellent. An interested party acting quickly can acquire decided bargain.

Box 495, THE RUBBER AGE.

HELP WANTED

SALESMAN to call on Rubber Manufacturers on Fillers and Pigments; preferably experienced in New England and Middle Atlantic States. Write fully your qualifications, etc., to Box 497, THE RUBBER AGE.

SALES MANAGER for Rubber Company manufacturing tire accessories and other rubber goods. He must know how to develop and maintain a selling organization, selling jobbers, manufacturers and chain stores. Excellent opportunity. Give full particulars in first letter. Box 498, THE RUBBER AGE.

SITUATION WANTED

ANXIOUS TO PROGRESS! Man with years of experience in purchasing, stock control, production and office management of rubberized fabrics wishes to make new connection. Write Box 499, THE RUBBER AGE.

Consulting Rubber Technologist

PRACTICAL

Twenty years' experience with the largest and most successful companies in the country

Physical and Chemical Testing

Special facilities for abrasion and quick age tests

Expert Advice to Correct Factory Trouble

New Processes and Formulas Developed

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LATE MARKET PRICES

Crude, Scrap & Reclaimed Rubber - Cottons and Fabrics

NEW YORK, OCTOBER 5, 1928

COTTON

REPORTS of poor weather and crop deterioration, combined with a general feeling that the recent price decline was carried too far, brought cotton quotations up to substantially higher levels than were registered two weeks ago. It is generally felt that the next government crop report will be much less than the figures given out as of August 1 and September 1.

The belief that the crop will be small is fostered not only by storm damage, and boll rot, but also by the fact that temperatures in most of the belt have been abnormally cool, retarding growth and giving indication of serious early frosts. Excessive shedding is reported in the eastern belt, and insect damage at least equal to that of last year is looked for.

An improvement in demand from both domestic and foreign spinners has been a feature of the fortnight, and this is expected to continue unless there is a sharp rise in values. According to the International Cotton Federation statistics, world mill stocks of American cotton on July 31 were only 2,112,000 bales as against 3,056,000 a year previous.

High, low and closing quotations as of October 4 were as follows:

	High Oct. 4	Low	Close	Close Sept. 20
October	19.24	18.98	18.99	17.73
December	19.20	18.95	18.95	17.68
January	19.16	18.90	18.92	17.64

Tire Fabrics

The tire fabric market has been active in spite of slight advances in both American and Egyptian peelers in sympathy with the raw cotton market. Mills now report orders on their books which will call for capacity production for the rest of the year.

CORD			
Peeler, carded, 23/5/3	lb.	.46½@	.47½
Peeler, carded, 23/4/3	lb.	.47½@	.48½
Peeler, carded, 13/3/3	lb.	.44½@	.45½
Peeler carded, 15/3/3	lb.	.44 @	.45
Egyptian, carded, 23/5/3	lb.	.54 @	.55
Egyptian, combed, 23/5/3	lb.	.60 @	.62
CHAFERS			
Carded, American, 8 oz.	lb.	.39 @	.41
Carded, American, 10 oz.	lb.	.40 @	.41
Carded, American, 12 oz.	lb.	.40 @	.43
Carded, American, 14 oz.	lb.	.38 @	.43
LENO BREAKER			
Carded American, 8¼ oz.	lb.	.39 @	.43
Carded American, 10¼ oz.	lb.	.39 @	.43
SQUARE WOVEN			
Carded American, 17¼ oz. 23-11 ply	lb.	.46 @	.46½
Carded American, 17¼ oz. 10-ply	lb.	.38 @	.40

Ducks

The cotton duck market enjoyed a fair demand during the fortnight but the advanced prices within the last few days are having the effect of slowing up buying interest. Late prices follow:

Belting and Hose	lb.	.34 @	.34½
Enameling	lb.	.34 @	.35
Single filling	lb.	.14½@	.15½
Double filling	lb.	.17½@	—

Sheetings

Prices on sheetings responded to the advance in cotton values during the last two weeks and the demand has dropped as a consequence. Sellers as well as buyers have become cautious and offerings have been as scarce as orders. Late prices were as follows:

40-inch, 2.50-yard	yd.	.12¼@	.12½
40-inch, 2.85-yard	yd.	@	.11
40-inch, 3.15-yard	yd.	@	.11⅜
40-inch, 3.60-yard	yd.	.09¾@	.09⅞
40-inch, 3.75-yard	yd.	@	.08⅝
40-inch, 4.25-yard	yd.	@	.07⅝

RECLAIMED RUBBER

The steady demand for reclaimed rubber which has characterized the market for the last year continued apparently unabated in the face of a low crude rubber market. Reclaimers report a continued high production to take care of the demand. While the consumption of reclaimed during September was slightly off from that of August the total tonnage remained high. There has been no change in price levels during the fortnight. Latest quotations follow:

High Tensile			
Super-Reclaim No. 1 Black	lb.	.12½@	.13
Super-Reclaim No. 2 Black	lb.	.11½@	.11⅝
High Tensile Red	lb.	.13¼@	.13½
Shoe			
Unwashed	lb.	.07¼@	.07½
Washed	lb.	.10 @	.10¼
Tube			
No. 1 (Floating)	lb.	.14½@	.15
No. 2 (Compounded)	lb.	.11 @	.11½
Tires			
Black, washed		.09½@	.10
Black, unwashed		.07½@	.07⅞
Black selected tires	lb.	.08 @	.08¼
Dark Gray	lb.	.09½@	.09¾
Light Gray	lb.	.12 @	.12½
White	lb.	.13 @	.13½
Truck, Heavy Gravity	lb.	.07 @	.07¼
Truck, Light Gravity	lb.	.07¾@	.08
Miscellaneous			
Mechanical Blends	lb.	.06¾@	.07½
Red	lb.	.13 @	.13¼

Scrap Rubber

In the face of continued high production on the part of reclaimers the scrap rubber market has held firm during the past two weeks. Accumulations are reported better, especially in tire scrap although boot and shoe scrap is still too cheap to interest collectors. Prices remain unchanged. Late prices are as follows:

(Prices to Consumer)

Auto tire peelings	ton	37.50	@39.00
Standard White auto	ton	50.00	@52.50
Mixed auto	ton	23.50	@25.00
Bicycle tires	ton	25.00	@27.50
Clean solid truck tires	ton	22.00	@24.00
Boots and shoes	lb.	.01⅝@	.01½
Arctics, trimmed	lb.	.00⅞@	01
Arctics, untrimmed	lb.	.00⅜@	.00⅞
Inner tubes, No. 1	lb.	.07 @	.07¼
Inner tubes, No. 2, compounded		.04¼@	.04½
Inner Tubes, Red	lb.	.05½@	.05⅝
Air Brake Hose	ton	35.00	@37.50
Rubber Hose	ton	18.00	@20.00

CRUDE RUBBER

A COMPLETE end to the former concern over crude rubber accumulations in the estates of Malaya was brought about by the census taken by British restriction authorities as of August 31. This revealed the surprising fact that the amount of rubber held on estates of 100 acres and over had declined from 53,666 tons at the end of July to 52,905. Rubber in the hands of dealers showed a gain of some 3,000 tons, but no significance is attached to this fact inasmuch as dealers' stocks are still less than reported on June 30.

This fact, together with the continued high production in the tire factories and the gains in output in plants producing miscellaneous rubber goods, served to bring the price of rubber in the New York outside market up from 18 to 18⅝ cents a pound. At this time even a further rise would not be unexpected, as factory demand is strong and stocks low both in London and the United States.

According to some sources, the fall in London prices in early September was due to continued English newspaper reports concerning synthetic rubber and scientific discoveries in the East which might lead to substantially higher rubber yields. The effect of such "scare" talk, not unusual when the commodity is at a high level, is surprising in view of the present low quotation levels.

Despite the gains made by standard ribbed smoked sheets, several of the crepes and other off-grades declined in price during the fortnight. At the close of the period December rubber was selling at a premium.

Prices on the New York outside market on October 4 were as follows:

Plantations—		
Ribbed Smoked Sheets—		
Spot-Mar.	18¾@	.18⅞
Apr.-June	.18½@	.18¾
First Latex, crepe spot	.19¼@	.19½
Amber Crepe, No. 2	.18¼@	.18⅜
Amber Crepe, No. 3	.17⅞@	.18¼
Amber Crepe, No. 4	.17⅝@	.17⅞
Brown Crepe, Rolled	.16⅝@	.16⅞
Brown Crepe, Clean, thin	.18 @	.18¼
Brown Crepe, specky	.18¼	Nominal
Liquid Latex, per gal.	@	1.50
Paras—		
Up-river Fine	.19¼@	.19½
Up-river Medium	Nominal	
Up-river Coarse	.13¼@	.13¾
Acre Bolivian, fine	.19¾@	.20
Caucho Ball, Upper	.12 @	.12¼
Islands, fine	Nominal	
Centrals—		
Central, scrap	.14 @	.14½
Esmeraldas	.14 @	.14½
Balata—		
Block, Colombia	Nominal	
Block, Cuidad	.38 @	.39

LONDON MARKET

Standard Ribbed Smoked Sheets—Buyers		
Spot-Oct.	8⅝@	8¾d
Nov.-Dec.	8¾@	8⅞d
Jan.-Mar.	9 @	9⅛d

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—Sellers		
Spot	8⅜@	8½d

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LATE RUBBER CHEMICAL PRICES

Accelerators — Colors — Softeners — Compounding Materials

NEW YORK, OCTOBER 5, 1928

INCREASES in production in various rubber goods factories and continued capacity output from tire and tube plants served to make the demand for chemicals and compounding ingredients steady and to keep the prices firm. Record production from automobile factories is expected to continue through October with only slight slackening up during November and December, and this will assure a continuation of the heavy schedules now current in all tire manufacturing establishments of the entire country.

The demand for the more popular accelerators is growing, and anti-oxidants are increasing in use to a great extent. Stearic acid, double pressed, and Stearex continue to maintain their advances of early September, and other softeners remain firm in their price levels. Vinegaire Tar, the new softener, is reported as having found a ready market and may be expected to gain steadily in popularity.

ACCELERATORS

Organic				
A-7	lb.	.55	@	.59
A-11	lb.	.62	@	.66
A-16	lb.	.57	@	.61
A-19	lb.	.58	@	.62
A-20	lb.	.64	@	.68
Aero-X	lb.	.75	@	—
Aldehyde ammonia, crystals	lb.	.65	@	.70
Aniline oil, drums, f.o.b. works	lb.	.15	@	.16¼
Crylene	lb.	.55	@	.65
paste	lb.	.45	@	.55
Di-Ortho-Tolylguanidine	lb.	.48	@	.50½
Diphenylguanidine	lb.	.40	@	.42½
Ethylidene aniline	lb.	.45	@	.47½
Formaldehyde Aniline, 140° m. p.	lb.	.33	@	.35½
Formaldehyde Aniline, 60° m. p.	lb.	.31	@	.33½
Grasselerator 102	lb.	.58½	@	.61
Grasselerator 552	lb.	—	@	4.45
Grasselerator 808	lb.	.79	@	.85
Grasselerator 833	lb.	1.17	@	1.30
Heptene	lb.	.40	@	—
Hexamethylene-tetramine	lb.	.57½	@	.60
Lithex	lb.	.18	@	.20
Methylenedianilide	lb.	.36	@	.37
Monex	lb.	3.25	@	—
Oynone	lb.	.68	@	.80
Para-Nitrosodimethylaniline, f.o.b. works	lb.	.92	@	.96
Piperidine-Piperidyldithio-Carbamate	lb.	4.45	@	4.60
R & H 40	lb.	.40	@	.42½
R & H 50	lb.	.40	@	.42½
R & H 397	lb.	.75	@	.77½
Safex	lb.	1.20	@	1.25
Tensilac, No. 39	lb.	.50	@	.52½
Tensilac, No. 41	lb.	.50	@	.52½
Thermlo F	lb.	.50	@	.55
Thiocarbanilide, drums	lb.	.25½	@	.26½
Thionex	lb.	3.25	@	—
Trimene	lb.	.75	@	—
base	lb.	1.20	@	—
Triphenylguanidine	lb.	.65	@	.70
Vulcanex	lb.	.68	@	—
Vulcone	lb.	.68	@	—
Vulcanol	lb.	1.03	@	1.08
Waxene	lb.	.30	@	.32
Z 88	lb.	.65	@	.69
Inorganic				
Lead, sublimed blue	lb.	.08¼	@	.08¾
Lead, white	lb.	.10½	@	.12½
Litharge, domestic	lb.	.09½	@	.12
Magnesia, calcined, light	per 100 lb.	5.35	@	5.45
heavy	per 100 lb.	3.65	@	3.75

COLORS

Blacks (See Compounding Materials)				
Blues				
Prussian	lb.	.33	@	.35
Ultramarine	lb.	.06	@	.30
Browns				
Sienna, Italian	lb.	.05	@	.12½
Umber, Turkey	lb.	.04½	@	.07
Greens				
Chrome, light	lb.	.27	@	.31
medium	lb.	.29	@	.32
dark	lb.	.31	@	.34
Chromium Oxide, bbl.	lb.	.34	@	.36
Reds				
Antimony crimson, 15/17	lb.	.44	@	.50
sulphur free	lb.	.50	@	.55
golden 15/17 F.S.	lb.	.18	@	.22
Indian English	lb.	.08	@	.12
Domestic (Maroon)	lb.	.08	@	.12
Oximony	lb.	.13¼	@	—
Red oxide, pure	lb.	.10	@	.12
Venetian red	lb.	.03	@	.06
Vermillion, quicksilver, English	lb.	1.85	@	1.95
Whites				
Lithophone, Akcolith	lb.	.05 3/5	@	.06
Lithophone, Azolith	lb.	.05¼	@	.05¾
Lithopone, Vanolith	lb.	.05¾	@	—
Titanox	lb.	.10	@	.10½
Cal. Base Pigment	lb.	.10	@	.10½
Zinx Oxide—American Process				
American Azo:				
ZZZ (lead free)	lb.	.06½	@	.07
ZZ (leaded)	lb.	.06⅝	@	.07⅛
Zinc Oxide—French Process				
White seal	lb.	.11⅝	@	—
Green seal	lb.	.10⅞	@	—
Red Seal		.09⅞	@	—
Yellows				
Chrome	lb.	.15½	@	.16½
Ocher, French medium	lb.	.03½	@	.06
domestic	lb.	.01⅝	@	.02

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85	@	24.50
Ammonia carbonate	lb.	.10½	@	.12
Asbestine	ton	14.75	@	18.00
Barium carbonate	lb.	.03½	@	.05
Barium Dust	lb.	.05	@	.06
Barytes southern off-color,	ton	12.00	@	18.00
Western prime white	ton	23.00	@	—
imported	ton	27.00	@	36.00
Basofor	lb.	.04½	@	—
Blacks				
Arrow "Aerfloted"	lb.	.08½	@	.12½
Bone Black	lb.	.05½	@	.11
Carbon, compressed	lb.	.08	@	.12
Carbon, uncompressed	lb.	.07½	@	.11½
Drop Black	lb.	.06	@	.10
Fumonex	lb.	.06	@	.09
Gastex	lb.	.05¼	@	.05½
Lamp Black	lb.	.12	@	.40
Micronex	lb.	.08½	@	.12½
Velvetex carbon	lb.	.04½	@	.06
Blanc fixe dry f.o.b. works	lb.	.03½	@	.03⅝
Carrara filler	lb.	.01⅝	@	.02
Catalpo (fact.)	lb.	.02	@	—
Chalk	ton	12.00	@	14.00
Clay, China, domestic	ton	8.00	@	9.00
Aerfloted Suprex	ton	10.00	@	22.00
Congaree, c. l. f.o.b. mine	ton	9.00	@	—
Mineral Flour, c. l. fob mine	ton	20.00	@	23.00
Tensulite		15.00	@	—
Glues, extra white	lb.	.22	@	.26
medium white	lb.	.20	@	.24
Magnesia, carbonate	lb.	.08¾	@	.11
Mica, powdered	ton	65.00	@	80.00
Rotten Stone (powdered)	lb.	.02½	@	.04½
Soapstone, powdered	ton	15.00	@	22.00
Starch, powdered	cwt.	3.30	@	3.70
Talc, domestic	ton	12.00	@	15.00
Velvetex	lb.	.04	@	.07
Whiting, commercial	cwt.	.85	@	1.00
English cliffstone	cwt.	1.50	@	—
Superfine	ton	10.00	@	12.00
Witco	ton	12.00	@	—
Wood pulp XXX	ton	45.00	@	—
Wood pulp X	ton	25.00	@	—
Zinc Carbonate	lb.	.09½	@	.10½
Zinc Stearate	lb.	.18½	@	.19½

MINERAL RUBBER

Genasco (factory)	ton	50.00	@	52.00
Montezuma, solid	ton	28.00	@	36.00
Montezuma, granulated	ton	32.00	@	42.00
Paradura	ton	62.50	@	65.00
Pioneer, MR, solid	ton	42.00	@	45.00
Pioneer-granulated	ton	52.00	@	55.00
R & H Hydro-Carbon	ton	27.05	@	29.00
Robertson, MR, solid	ton	34.00	@	80.00
M.R. (gran)	ton	38.00	@	80.00

SOFTENERS

Acids				
Nitric, 36 degrees	cwt.	5.00	@	5.25
Sulphuric, 60 degrees	ton	10.50	@	11.50
66 degrees	ton	15.00	@	16.00
Tartaric, crystals	lb.	.35	@	.36
Acids, Fatty				
Stearex	lb.	.15	@	.20
Stearic, double pressed	lb.	.18	@	.22
Alkalies				
Caustic soda, 76%	cwt.	3.76	@	3.91
Soda ash, 58% C.L.	cwt.	1.40	@	
Oils				
Corn, refined, bbls.	lb.	.11	@	.11½
Cottonseed, crude		.08½	@	.08¾
Cycline	gal.	.27	@	.34
Degras (c.l. 100 bbls.)	lb.	.03¾	@	—
Less c. l. (10-25 bbls.)	lb.	.04	@	—
Lots less than 10 bbls.	lb.	.04¼	@	.04½
Fluxrite	lb.	.05	@	.06
Hexalin	lb.	.60	@	—
Acetate	lb.	.70	@	—
Linseed, Raw C.L. bbl.	lb.	.09½	@	.10
Palm Lagos	lb.	.07¼	@	.07½
Niger	lb.	.07¾	@	.08
Vansulol	lb.	.10½	@	—
Para-Flux	gal.	.17	@	—
Peanut, domestic, crude	lb.	.12	@	.12¼
Petrolatum, white	lb.	.08	@	.08½
dark amber	lb.	.03⅝	@	.03⅝
Pine, steam distilled	gal.	.65	@	.70
Rapeseed, refined	gal.	1.04	@	1.06
second rectified	gal.	.58	@	—
Resins and Pitches				
Pitch, Burgundy	lb.	.06½	@	.07½
coal tar	gal.	.05½	@	.06
pine, 200 lb. gr. wt.	bbl.	9.00	@	10.00
Rosin, grade K, 280 lb.	bbl.	8.55	@	—
Pigmentar	gal.	.33	@	.41
Tar Retort, 50 gal.	bbl.	12.50	@	13.00
Solvents				
Acetone, pure	lb.	.13	@	
Alcohol denatured, No. 1 bbls.	gal.	.37½	@	.44½
Benzol, 90%	gal.	.28	@	—
Carbon bisulphide	lb.	.05½	@	.06¼
Carbon tetrachloride	lb.	.06¼	@	.07
Motor gasoline, steel bbls.	gal.	.17	@	—
Naptha, solvent	gal.	.35	@	.40
Turpentine, spirits	gal.	.60	@	.64
wood	gal.	.50	@	.54
Waxes				
Beeswax	lb.	.56	@	.58
Carnauba	lb.		@	.50
Ceresin, white	lb.	.10	@	.11
Montan, crude	lb.	.07	@	.07½
Ozokerite, black	lb.	.24	@	.25
green	lb.	.26	@	.30
Miscellaneous				
RSL Mold Solution	gal.	.75	@	.100

ANTI-OXIDANTS

Antox	lb.	.79	@	.83
Neozone	lb.	.74	@	—
Oxynone	lb.	.68	@	.80
Resistox	lb.	.54	@	.57
Stabilite	lb.	.65	@	—
VGB	lb.	.55	@	.66

SUBSTITUTES

Black	lb.	.08	@	.14
White	lb.	.10	@	.16
Brown	lb.	.08	@	.15

VULCANIZING INGREDIENTS

Sulphur Chloride (drums)	lb.	.03¼	@	.03½
Sulphur flour,				
Superfine bags	cwt.	2.20	@	2.80
Superfine, bbls.	cwt.	2.55	@	3.10
100% pure, refined, bags	cwt.	2.60	@	3.15
bbls.	cwt.	2.95	@	3.50

TIRES & TUBES
CRUDE RUBBER

STATISTICAL SECTION

AUTOMOBILES
GASOLINE

WITH the apprehension over the supposed accumulations of crude rubber in the Far East practically dispelled, normal factors in the market have begun to exert their influence over price quotations and the general situation. The August 31 census of the stocks on Malayan estates showed a decrease instead of the expected gain. The decrease was slight, being only of 761 tons, and was more than balanced by a gain of some 3,000 tons in dealers' stocks, but it served to show that the entire conception of an enormous surplus of rubber in Malaya on November 1 was only an imaginary bugaboo.

London stocks continue at their lowest figure for the past two years, and stocks at Singapore and Penang do not approach the totals of this time last year. The amount of rubber invoiced to the United States during the last two weeks of September was still lower than the average August shipments, and it is expected that stocks on hand in this country, already at their lowest point since October, 1926, will go down even further.

The production of automobiles and the consumption of gasoline are breaking all previous records, and it is these indications of the healthy state of the industry that seem to be winning the most attention at present.

Latest figures covering imports and exports from the leading consuming and producing markets have been added to the appropriate tables in this section.

PLAN OF THE SECTION

The statistics included in this section have been chosen for their constant importance to the rubber industry. The tables are reprinted in the same relative position in every issue, each table being kept current by the addition of new figures as soon as they become available. The section accordingly affords the most up-to-date, complete and convenient statistical service in the industry.

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U. S. Imports and Exports of Crude Rubber

	Gross Imports			Re-exports			Net Imports
YEARS	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons
1921	185,394	73,772,677	17.76	5,716	2,414,924	18.86	179,678
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,258	339,874,774	35.60	27,775	24,735,488	39.76	398,483
1926:							
Jan.	42,404	72,528,151	76.36	2,059	3,747,505	81.24	40,345
Feb.	32,865	58,733,370	79.78	1,430	2,280,168	71.17	31,435
Mar.	42,152	70,589,581	74.76	1,836	2,735,234	66.51	40,316
Apr.	34,544	48,742,539	62.99	1,128	1,605,093	63.58	33,416
May	29,756	36,896,080	55.35	1,052	1,558,987	66.17	28,704
June	24,900	34,498,561	61.85	1,105	1,371,217	55.41	23,795
July	35,820	33,061,281	41.20	1,554	1,743,854	50.09	34,266
Aug.	27,400	24,670,752	40.21	1,318	1,339,563	45.38	26,082
Sept.	37,112	32,625,032	39.25	1,437	1,519,870	47.20	35,675
Oct.	29,746	25,320,558	38.49	1,366	1,316,270	43.03	28,110
Nov.	39,155	34,890,536	39.78	1,482	1,411,517	42.51	37,673
Dec.	37,754	33,261,366	39.33	1,904	1,841,305	43.16	35,850
1927:							
Jan.	43,340	36,753,719	37.86	1,525	1,444,734	42.28	41,815
Feb.	28,337	23,110,257	36.41	2,451	2,277,297	41.47	25,886
Mar.	35,515	28,693,016	36.07	2,763	3,249,665	52.50	32,752
Apr.	46,202	37,321,505	36.06	1,575	1,428,425	40.48	44,627
May	36,518	30,984,377	37.88	2,782	2,501,562	40.14	33,736
June	33,045	27,850,014	37.62	1,775	1,550,592	39.00	31,270
July	37,677	31,678,259	37.53	1,958	1,560,853	35.59	35,719
Aug.	32,810	26,396,931	35.92	1,809	1,382,768	34.12	31,001
Sept.	33,301	25,314,412	33.94	3,500	3,036,929	38.74	29,801
Oct.	30,184	22,163,282	32.78	2,513	2,042,713	36.29	[illegible]
Nov.	38,592	27,395,428	31.69	2,469	2,014,196	36.43	36,123
Dec.	30,737	22,213,574	32.26	2,655	2,245,754	37.77	28,082
1928:							
Jan.	39,108	30,278,444	34.56	1,988	1,734,990	38.95	37,120
Feb.	33,664	27,763,655	36.82	2,738	2,229,589	36.35	30,926
Mar.	40,688	32,109,376	35.23	3,718	2,587,434	31.07	36,950
Apr.	37,958	27,296,346	32.23	2,272	1,415,024	27.80	35,686
May	31,058	19,058,672	27.80	2,399	1,386,307	25.80	28,659
June	27,764	14,121,219	22.71	2,621	1,400,697	23.86	25,143
July	27,129	11,581,969	19.06	3,087	1,451,446	20.99	24,042
Aug.	30,600	12,599,576	18.39	2,377	1,084,646	20.37	28,223
Sept.							
Oct.							
Nov.							
Dec.							

U. S. Consumption of Crude Rubber

(Rubber Association of America statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1921	1922	1923	1924	1925	1926	1927	1928
Jan.	5,045	16,938	30,106	29,058	29,638	32,196	31,518	34,403
Feb.	5,955	14,767	30,149	25,736	29,761	31,136	30,137	33,702
Mar.	9,190	21,408	36,629	28,385	33,498	32,936	36,141	35,688
Apr.	13,084	19,294	29,085	27,129	34,139	32,696	35,871	32,772
May	16,023	23,246	36,155	25,845	35,322	29,364	34,592	37,333
June	16,142	31,713	24,272	22,753	35,822	28,598	33,801	37,676
July	18,310	24,522	17,685	23,396	36,053	27,577	29,219	37,497
Aug.	22,649	29,631	20,359	28,982	35,909	34,533	33,460	42,927
Sept.	16,705	24,410	17,594	31,497	31,691	32,904	27,214	
Oct.	16,814	26,881	21,321	31,520	29,047	29,836	26,790	
Nov.	14,105	24,950	20,437	27,289	28,853	28,080	26,792	
Dec.	15,482	25,070	21,902	27,199	28,748	26,293	25,492	
Totals	170,504	282,560	305,694	328,769	388,481	366,149	371,027	

Figures on Quarterly Basis

Quarter	1921	1922	1923	1924	1925	1926	1927	1928
Jan./Mar.			96,776	87,609	95,263	94,301	99,216	103,558
Apr./June	65,463	127,360	89,493	75,674	104,099	87,109	103,242	103,500
July/Sept.			55,621	83,813	99,493	93,793	89,210	
Oct./Dec.	105,962	155,067	63,617	92,656	85,789	83,212	80,860	
Totals	171,425	282,427	305,507	339,752	384,644	358,415	372,528	207,058

Note—The Rubber Association estimates its monthly rubber consumption figures to be 90 per cent complete. Up until 1925 the quarterly figures were likewise estimated to be 90 per cent complete; beginning with 1925 an estimate of 92 per cent completeness has been used. These estimates have been used in raising the figures in this table to 100 per cent. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

Rubber Invoiced to the U. S.

(Reported by American Consuls—Quantities in Long Tons)

During the Week Ended	From Br. Malaya	From Ceylon	From Dutch East Indies	From London & Liverpool	Total
July 28	4,685	1,065	2,083	178	8,011
Aug. 4	4,271	692	1,335	1,582	7,880
Aug. 11	4,916	740	2,373	916	8,945
Aug. 18	6,416	776	1,813	944	9,949
Aug. 25	6,932	946	2,340	453	10,671
Sept. 1	5,501	979	1,238	835	8,553
Sept. 8	5,105	226	2,254	295	7,880
Sept. 15	5,086	1,562	1,342	734	8,724
Sept. 22	5,553	709	1,892	505	8,659
Sept. 29	4,402	979	2,034	1,498	8,913

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave.
1926																																
January	—	—	—	87	87¼	85½	86½	87½	87¾	—	88½	88¼	88¼	85½	84½	82½	—	75½	75½	75½	75	72	72½	—	68	66½	67	69¼	70½	69	—	79½
February	67	67½	—	66¾	68	69	—	—	—	—	66	66	65½	63	62	60½	60½	60	59	60	—	56	56	55	52	51¾	51	—	—	—	—	62¾
March	55	58	58	53	53½	57½	—	—	56	56	60	63	61½	62	61	60½	61	62	61	61½	61	61	61	60	60	59½	60	58½	58	58	—	59
April	59	—	59	—	59	58	56½	56½	53	53	—	51½	50½	49¾	47½	48½	47	47½	47½	48½	48	49	48	48½	48	48	48	48	49	48½	—	51¼
May	48½	—	60	50¼	49½	49½	49½	49½	—	49	49½	49	48½	47½	47½	—	43	47½	47½	47½	47½	46¾	46	46	45	45	46	46	48½	48	—	47¾
June	42	—	—	42	41½	41½	41½	42	43	—	42	42	41	40	40	40	40	43	43	44	44	44	43½	43½	43	43	42	42	42	42	—	42½
July	42	—	—	42	—	41½	41½	41½	41½	41½	41½	41½	41	40	40	40	40	38	40	41½	41½	41	41½	41½	41½	41½	41½	41	41	39	—	41¼
August	—	—	—	38½	—	38¾	37	38¾	38¾	37½	37¾	37¾	37½	38½	38½	38½	40½	40¼	39½	39	41½	41	41½	39¾	39	39	39	39½	42¼	42½	39	39½
September	40¾	40¾	40¾	40¾	—	—	40¾	—	40¾	40¾	40¾	—	42½	42½	42½	40¾	40¾	40¾	40¾	40¾	42¾	42¾	42¾	42	42¾	42¾	42¾	42½	42½	42½	40	41
October	43	43	—	43¾	43¾	42¾	42¾	42½	42½	42½	42½	42½	42½	43½	43½	43½	43½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	—	42½
November	41¾	—	41	41¼	41½	41½	—	41½	41½	41½	41½	41¼	41¼	40¾	40¾	40¾	40½	42½	42½	42¾	39	38	38	38½	—	—	37¾	37	37	37	—	38½
December	36¾	37½	37½	37½	—	37	—	37¾	37¾	37	37½	—	37½	37¾	37¾	38	38	38¾	38½	38½	38	38¾	38½	38¾	—	—	39	38½	38½	38½	—	38¾
1927																																
January	—	37½	38½	39	39¼	39¾	40¾	40¾	—	40½	40¾	40¾	40	39¾	39¾	38	39¾	38¾	38¾	38½	38¼	38	38	38¼	38	38½	38¾	38	38	38	—	38¾
February	—	37½	37¾	37¾	37½	—	—	37¾	—	37¾	37¾	41¾	—	38½	38½	38	38½	38½	38½	38¾	38½	38½	41½	40¾	39¾	39¾	39¾	39¾	41	41¼	41¼	39¾
March	—	39¾	40	40¼	41	41¼	40¾	40¾	40¾	40¾	41¼	41¾	41	41¾	41¾	41¾	41¾	41¾	41½	41¾	41¾	41¾	41¾	40¾	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41
April	—	41½	—	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	41	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40½	—	40¾	40¾
May	—	40½	—	41	41	41	40¾	40¾	40¾	40¾	40¾	40¾	—	40¾	—	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	41	40¾	40¾	40¾	40¾	—	—	—	40¾	87¼
June	—	40¾	40¾	40¾	40¾	39½	39½	38¾	38¾	37¾	37¾	37¾	—	35	34½	35½	35½	35½	35½	34¾	35½	35½	35½	36¾	36¾	36¾	36¾	35¾	35¾	35	—	35
July	—	35½	—	—	35½	34¾	34¾	34¾	34¾	34¾	34¾	34¾	34¾	34¾	34¾	34¾	34¾	34¾	34¾	34¾	34¾	34¾	34¾	34¾	34¾	34¾	34¾	34¾	34¾	34¾	34	34¾
August	—	35¼	35¼	—	35¼	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½
Sept.	34	33¾	—	—	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾
Oct.	35	35¼	35½	35½	35½	36½	—	—	36¾	36¾	36¾	36¾	36¾	36½	36½	36¾	36¾	36¾	37½	37½	36¾	36¾	36¾	36¾	36¾	36¾	36¾	36¾	35¼	35¼	35¼	35¾
Nov.	—	40¼	40¾	40¾	40¾	—	40½	40	—	40½	40½	40	40½	40	39¾	40	40¾	40¾	40¾	40¾	40¾	40½	40¾	40¾	40¾	40½	41	41¼	40¾	40	41½	—	40¾
Dec.	—	40½	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1928																																
January	—	—	41¾	41¼	41¼	41¼	41	—	40¾	40½	40½	40¼	40¼	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	39¼	29½	—	40¼
February	—	37½	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	28⅞	28⅞	—	32¾
March	—	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	28	27¾	26¾	26¾
April	—	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	27¾	27¾	27¾	27¾
May	—	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	27¾	27¾	27¾	27¾
June	—	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	27¾	27¾	27¾	27¾
July	—	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	27¾	27¾	27¾	27¾
August	—	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	27¾	27¾	27¾	27¾
Sept.	—	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	27¾	27¾	27¾	27¾
Oct.	—	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	27¾	27¾	27¾	27¾
Nov.	—	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	27¾	27¾	27¾	27¾
Dec.	—	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	27¾	27¾	27¾	27¾

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1921

Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15
1911	141.30	1915	65.85	1919	48.70
1912	121.60	1916	72.50	1920	36.30
1913	82.04	1917	72.23	1921	16.36

Average Monthly Price per Pound Since 1922

Months	1922 Cents	1923 Cents	1924 Cents	1925 Cents	1926 Cents	1927 Cents	1928 Cents
Jan.	18.82	32.73	25.86	36.71	79.50	38.75	40.25
Feb.	16.12	35.14	25.29	36.01	62.25	38.25	32.75
Mar.	14.53	34.21	22.83	41.00	59.00	41.04	26.82
Apr.	15.99	32.48	22.51	43.64	51.25	40.86	18.97
May	15.25	27.39	18.89	58.47	47.75	40.76	18.99
June	15.11	26.88	18.81	77.26	42.50	37.25	19.59
July	14.67	26.10	22.16	103.16	41.03	23.44	19.40
Aug.	13.93	28.84	26.17	82.99	38.50	35.12	19.46
Sept.	14.44	28.95	27.56	88.88	41.00	33.67	18.47
Oct.	19.78	26.93	31.13	98.01	42.50	34.82	
Nov.	23.88	27.14	34.33	104.80	38.50	37.58	
Dec.	27.42	26.60	37.88	98.51	38.25	40.68	
Average for Year	17.50	29.45	26.20	72.46	48.50	37.72	

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Sixth Restriction Year—Third Quarter

Day	Aug.	Sept.	Oct.	Day	Aug.	Sept.	Oct.
1	9⅜	—	8½	17	9½	8⅝	—
2	9⅜	—	8⅝	18	9½	8½	—
3	9½	9	8½	19	—	8⅜	—
4	—	8⅞	8½	20	9⅜	8⅜	—
5	—	8¾	—	21	9¼	8⅜	—
6	—	8⅝	—	22	9¼	8⅜	—
7	9½	8⅝	—	23	9¼	—	—
8	9½	8⅜	—	24	9¼	8⅜	—
9	9½	—	—	25	9⅛	8½	—
10	9½	8¾	—	26	—	8⅝	—
11	9½	8¾	—	27	9	8½	—
12	—	8½	—	28	9	8½	—
13	9½	8⅝	—	29	9	8½	—
14	9½	8⅜	—	30	9	—	—
15	9⅜	8½	—	31	9	—	—
16	9½	—	—				

The average price for the period for which the daily prices are reported above is approximately 8.901 pence. All restrictions on rubber exports from British Malaya and Ceylon will officially cease on October 31.

Average Price in Previous Quarters

Quarter	1922-23	1923-24	1924-25	1925-26	1926-27	1927-28
Nov.-Jan.	14.285	14.175	17.9983	46.709	19.265	19.023
Feb.-Apr.	16.858	12.917	19.356	28.103	19.696	12.591
May-July	14.242	10.947	38.469	21.001	18.165	9.154
Aug.-Oct.	14.944	14.632	43.269	20.199	16.620	

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Day of Month	Sept.	Oct.	Day of Month	Sept.	Oct.	Day of Month	Sept.	Oct.
1	——	19.45	11	18.25	——	21	18.45	——
2	——	19.45	12	18.30	——	22	18.90	——
3	——	19.35	13	17.80	——	23	——	——
4	19.05	19.25	14	17.80	——	24	19.05	——
5	19.25	——	15	17.80	——	25	18.90	——
6	19.35	——	16	——	——	26	19.15	——
7	19.40	——	17	17.90	——	27	19.60	——
8	19.40	——	18	17.65	——	28	19.30	——
9	——	——	19	17.95	——	29	19.30	——
10	18.50	——	20	17.90	——	30	——	——
						31	——	——

Average Monthly Price Per Pound

Month	1926 Cents	1927 Cents	1928 Cents	Month	1926 Cents	1927 Cents	1928 Cents
Jan.	20.85	13.42	19.12	Aug.	18.57	20.04	19.28
Feb.	20.60	14.10	18.40	Sept.	17.02	21.95	18.67
Mar.	19.35	14.32	19.38	Oct.	13.14	20.55	
Apr.	19.13	14.75	20.63	Nov.	12.86	20.22	
May	18.92	16.07	21.58	Dec.	12.68	19.58	
June	18.57	16.85	21.50	Average for Year	17.53	17.49	
July	18.71	18.00	21.36				

Stock of Crude Rubber in the U. S.

(All Quantities in Long Tons)

At	ON HAND			AFLOAT			ON HAND AND AFLOAT		
End of	1926	1927	1928	1926	1927	1928	1926	1927	1928
Jan.	55,198	76,172	110,244	46,296	45,312	41,256	100,434	121,484	151,500
Feb.	58,035	91,186	108,955	46,935	42,166	43,316	104,970	133,352	152,271
March	61,822	85,740	114,061	43,567	49,600	39,324	105,389	135,340	153,385
April	55,261	92,757	113,083	41,905	38,963	33,986	97,166	131,720	147,069
May	64,360	94,563	105,356	40,303	44,181	34,374	104,663	138,744	139,730
June	60,460	89,250	90,198	40,907	47,233	40,001	101,367	136,483	130,119
July	64,900	98,469	83,242	38,062	40,587	42,304	102,962	139,056	125,546
Aug.	60,870	96,148	68,994	37,360	40,937	51,875	98,230	137,085	120,869
Sept.	62,078	97,829		42,464	37,966		105,542	135,793	
Oct.	64,089	97,452		52,930	42,804		117,919	140,256	
Nov.	69,385	101,034		47,311	37,076		116,696	138,110	
Dec.	72,520	100,130		52,020	47,938		124,540	148,068	

(Rubber Association of America figures raised to 100%.)

Stock of Crude Rubber in London

(No. of tons in Wharves and Warehouses, including Latex)

At end of:	1920	1921	1922	1923	1924	1925	1926	1927	1928
Jan.	19,300	56,573	67,252	73,498	57,460	27,172	9,994	54,994	66,524
Feb.	18,329	59,439	67,623	70,483	56,732	23,425	10,004	58,826	62,964
Mar.	18,969	63,913	66,670	63,438	55,647	18,104	13,127	63,055	58,272
Apr.	20,072	68,759	68,637	58,770	54,559	12,949	18,773	66,897	53,425
May	20,921	70,403	70,146	54,439	51,615	5,895	20,384	67,169	44,628
June	22,517	69,408	71,597	51,050	51,115	5,318	23,984	63,902	38,756
July	25,346	71,065	71,515	49,937	52,073	4,258	27,727	63,717	35,429
Aug.	30,674	73,211	72,112	58,427	49,700	4,619	30,165	64,491	
Sept.	35,504	72,175	70,977	54,523	44,011	5,453	35,077	68,236	
Oct.	41,743	69,229	68,536	58,891	37,523	5,086	42,138	69,569	
Nov.	45,550	70,786	68,548	60,074	33,593	3,869	44,057	67,050	
Dec.	50,652	69,792	72,299	60,246	29,488	5,697	48,918	63,793	

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1927					
October	68,519	70,167	70,916	70,060	69,551
November	69,660	69,501	69,850	67,318	——
December	65,869	66,011	64,761	63,397	63,207
1928					
January	64,360	65,524	65,450	66,285	——
February	65,909	64,945	63,769	63,103	——
March	61,978	61,920	61,033	59,644	58,197
April	58,732	58,945	56,819	53,360	——
May	52,015	50,837	48,705	44,628	——
June	43,716	42,683	41,185	40,083	38,611
July	36,915	35,925	35,238	35,445	——
August	34,294	33,649	32,591	32,815	——
September	31,933	31,477	32,110	31,884	31,462

Rubber in Singapore and Penang

(Stocks held by Dealers—Quantities in Long Tons)

End of	1926	1927	1928	End of	1926	1927	1928
Jan.	16,726	25,440	25,868	July	23,101	22,558	18,663
Feb.	13,653	26,766	22,867	Aug.	23,362	25,764	18,971
Mar.	18,389	27,844	20,538	Sept.	25,997	25,178	
Apr.	16,328	24,543	16,946	Oct.	26,614	25,790	
May	16,967	25,133	17,437	Nov.	25,486	28,369	
June	19,416	21,898	18,207	Dec.	26,443	25,798	

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1922	16,297,735	0.0	1925	26,001,664	66.8
1923	23,140,620	0.6	1926	24,199,524	78.8
1924	21,863,311	19.7	1927	19,700,003	79.1
1928			1928		
January	1,811,534	87.8	July	2,209,692	85.9
February	1,806,437	86.5	August	2,318,898	80.2
March	2,420,084	86.4	September	——	——
April	2,316,324	88.4	October	——	——
May	2,185,592	84.0	November	——	——
June	2,429,453	83.1	December	——	——

U. S. Consumption of Gasoline

(In Barrels of 42 Gallons)

MONTHS	1924	1925	1926	1927	1928
January	11,918,000	14,386,000	17,582,000	17,888,000	20,939,000
February	9,626,000	13,210,000	15,814,000	18,240,000	21,136,000
March	10,961,000	14,890,000	19,302,000	22,464,000	24,041,000
April	14,583,000	19,013,000	20,848,000	23,371,000	25,712,000
May	15,889,000	20,459,000	24,213,000	26,579,000	27,355,000
June	16,421,000	20,724,000	23,803,000	27,799,000	29,022,000
July	18,610,000	22,879,000	24,752,000	29,784,000	30,960,000
August	19,825,000	22,323,000	26,912,000	29,779,000	33,148,000
September	16,871,000	20,177,000	22,929,000	28,409,000	
October	18,029,000	19,826,000	23,973,000	25,497,000	
November	16,607,000	18,024,000	20,618,000	24,400,000	
December	15,663,000	17,954,000	21,419,000	23,718,000	
TOTAL	185,003,000	223,865,000	262,165,000	297,928,000	

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1922	1923	1924	1925	1926	1927
Production	40,932	45,259	51,633	60,845	61,237	64,439
Shipments	39,987	45,204	50,120	59,262	59,002	64,059
Inventory[2]	6,132	5,772	7,427	8,142	10,456	10,264

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1926	1927	1928	1926	1927	1928	1926	1927	1928
Jan.	4,587	4,965	5,491	2,974	4,932	5,394	9,947	10,432	9,949
Feb.	4,865	5,095	6,363	3,436	4,458	5,031	11,164	11,075	11,721
Mar.	5,456	6,276	6,819	4,561	5,701	5,731	12,004	11,583	12,389
Apr.	5,846	6,299	6,178	4,980	5,701	5,812	12,461	12,122	12,717
May	5,023	6,151	6,759	5,211	5,657	6,457	12,348	12,462	13,024
June	5,422	6,202	6,692	5,724	6,253	7,117	11,968	12,462	12,162
July	4,950	5,087	6,498	6,337	5,973	7,895	10,592	11,326	11,157
Aug.	5,872	5,752		6,744	6,393		9,732	10,721	
Sept.	5,706	4,822		6,040	5,717		9,318	9,722	
Oct.	5,103	4,773		4,544	4,799		9,917	9,665	
Nov.	4,324	4,502		3,733	4,306		10,297	10,136	
Dec.	4,683	4,497		4,718	4,165		10,456	10,264	

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1922	1923	1924	1925	1926	1927
Production	50,850	60,116	70,706	82,614	76,618	70,823
Shipments	49,673	59,072	68,016	81,004	71,591	72,896
Inventory[2]	7,643	8,425	11,052	11,313	16,200	13,692

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1926	1927	1928	1926	1927	1928	1926	1927	1928
Jan.	6,809	5,337	5,441	3,723	6,016	6,072	14,361	15,585	12,982
Feb.	6,825	5,658	6,895	3,736	5,120	5,431	17,090	16,075	14,650
Mar.	7,030	7,184	6,231	4,987	6,157	5,731	19,131	17,096	15,573
Apr.	6,554	7,373	6,661	5,051	6,359	5,702	20,674	17,801	16,638
May	6,149	6,737	7,168	6,304	6,140	6,300	21,141	18,389	17,702
June	6,171	6,306	6,953	6,898	6,832	7,136	20,243	17,858	17,159
July	5,729	5,284	6,674	8,569	7,070	8,729	17,267	16,004	14,974
Aug.	7,424	6,480		9,579	7,983		15,462	14,664	
Sept.	7,590	5,651		7,762	6,758		15,312	13,511	
Oct.	6,208	5,065		5,474	5,024		15,929	13,539	
Nov.	4,852	4,775		4,045	4,723		16,604	13,585	
Dec.	5,277	4,969		5,463	4,712		16,200	13,692	

(1) Rubber Association of America figures, raised to 100%. The Association estimates its figures to be 75% representative or complete when issued and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States			Canada			
	Total	Passenger Cars	Trucks	Total	Passenger Cars	Trucks	Grand Total
1921	1,595,504	1,452,902	142,402	66,246	61,098	5,148	1,661,550
1922	2,547,208	2,302,923	244,285	102,053	94,904	7,149	2,649,261
1923	4,020,255	3,631,728	388,527	146,438	129,228	17,210	4,166,693
1924	3,600,918	3,203,049	397,869	135,246	117,765	17,481	3,736,164
1925	4,265,704	3,760,459	505,245	161,389	139,311	22,078	4,427,093
1926	4,298,799	3,808,753	490,046	205,092	164,483	40,609	4,503,891
1927							
Jan.	238,926	199,650	39,276	15,376	11,745	3,631	254,302
Feb.	304,758	264,171	40,587	18,655	14,826	3,829	323,413
March	394,430	345,911	48,519	23,250	19,723	3,527	417,680
April	404,743	357,009	47,734	24,611	20,890	3,721	429,354
May	404,099	357,148	46,951	25,708	21,991	3,717	429,807
June	321,959	278,728	43,231	19,208	16,470	2,738	341,167
July	268,474	236,866	31,608	10,987	8,719	2,268	279,461
Aug.	308,807	274,378	34,429	12,526	10,139	2,387	321,333
Sept.	260,420	226,440	33,980	11,262	8,681	2,581	271,682
Oct.	219,712	183,041	36,671	7,791	6,236	1,555	227,503
Nov.	134,381	109,742	24,639	6,617	5,173	1,444	140,998
Dec.	133,178	105,784	27,394	3,435	2,277	1,158	136,613
TOTAL	3,393,887	2,938,868	453,019	179,426	146,870	32,556	3,573,313
1928							
Jan.	225,039	199,032	26,007	8,463	6,705	1,758	282,502
Feb.	323,368	290,830	32,358	12,504	10,315	2,189	335,872
March	412,825	371,408	41,417	9,724	7,478	2,246	422,549
April	409,948	364,877	45,071	24,240	20,546	3,694	434,188
May	425,990	375,798	50,192	33,942	29,764	4,178	459,932
June	396,967	356,439	40,528	28,399	25,341	3,058	425,366
July	390,445	337,933	52,512	25,226	20,122	5,104	415,671
Aug.	458,429	400,689	57,740	31,245	24,274	6,971	489,674
Sept.							
Oct.							
Nov.							
Dec.							

Exports of Crude Rubber from Principal Producing Countries

(*Long Tons*)

	BRITISH MALAYA[1]							DUTCH EAST INDIES[3]						
	Gross Exports	Imports	Gross Exports Minus Imports	Ceylon[2]	India & Burma[2]	Sarawak[4]	British North Borneo[5]	Siam[4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China[4]	Amazon Valley	All Other[6]	World Total[7]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,955
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	517,523
1926	391,328	151,249	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1926:															
Apr.	23,727	10,565	13,162	3,766	590	679	374	293	4,226	4,598	6,285	410	2,318	1,529	38,230
May	31,231	10,604	20,627	3,944	691	927	410	279	4,440	5,358	8,737	502	1,353	1,464	48,732
June	30,624	11,764	18,860	4,208	452	779	512	275	4,444	6,125	10,614	549	1,213	1,279	49,310
July	28,824	15,280	13,544	4,422	938	911	498	439	4,618	5,612	13,112	1,521	1,565	1,148	48,328
Aug.	34,625	13,595	21,030	5,666	521	890	476	316	4,132	5,699	10,390	378	1,888	1,097	52,483
Sept.	35,913	13,972	21,941	6,015	651	888	689	457	4,065	6,568	11,391	681	2,156	822	56,324
Oct.	39,367	15,203	24,164	5,672	634	805	473	385	4,058	6,998	11,491	661	1,904	1,023	58,268
Nov.	34,302	12,201	22,101	4,228	1,110	685	547	285	3,988	5,816	9,422	718	1,911	1,259	52,070
Dec.	36,811	14,716	22,095	6,498	1,176	895	617	338	5,054	7,117	12,786	790	3,821	714	61,901
1927:															
Jan.	34,946	14,995	19,951	6,697	921	959	585	304	4,187	6,706	10,690	941	3,482	981	56,404
Feb.	27,528	11,697	15,831	3,571	1,469	552	445	360	4,078	6,526	10,535	675	2,104	1,098	47,244
Mar.	41,346	17,464	23,882	7,142	1,124	997	639	432	5,657	7,004	12,905	733	3,178	1,791	65,484
Apr.	29,041	13,069	15,972	3,349	723	984	452	526	4,666	5,531	10,197	557	2,451	1,520	46,928
May	31,393	15,491	15,902	3,124	760	786	415	348	5,430	5,529	13,410	586	2,460	1,207	49,957
June	32,607	14,706	17,901	3,348	856	1,100	539	409	4,818	5,518	9,109	772	889	1,731	46,990
July	23,947	12,697	11,250	4,018	827	859	544	333	4,771	6,142	11,566	519	1,757	1,113	43,699
Aug.	30,371	17,105	13,266	5,357	688	1,133	623	546	4,355	6,682	12,440	716	1,928	969	48,703
Sept.	29,835	12,095	17,740	4,911	479	645	566	498	3,635	5,957	9,853	497	2,072	1,213	48,066
Oct.	29,846	15,801	14,045	5,245	802	721	591	542	3,810	7,755	13,633	775	2,752	939	51,520
Nov.	28,277	19,860	8,417	4,464	1,277	1,241	591	600	4,127	6,587	14,395	683	2,369	1,627	46,378
Dec.	32,185	17,865	14,320	4,130	1,395	946	592	664	5,763	7,878	13,438	1,191	3,340	1,444	55,101
1928:															
Jan.	27,731	16,618	11,113	4,352	1,605	842	500*	525	4,851	7,988	11,360	720	2,273	1,025	47,154
Feb.	28,813	12,911	15,902	4,353	1,081	667	500*	536	4,052	6,757	8,635	723	1,612	1,276	46,094*
Mar.	27,813	10,508	17,305	3,460	775	645	500*	269	3,999	5,826	9,690	613	2,750	1,211	47,043*
Apr.	20,029	9,335	10,694	3,460	789	630	500*	258	3,993	5,040	5,538	518	1,014	1,323	33,757
May	26,403	10,350	16,053	3,125	654	842	500*	241	4,943	5,355	10,382	619	2,062	1,200*	45,976*
June	22,930	16,168	6,762	3,125	963	926	500*	451	5,419	5,863	13,623	902	1,399	1,200*	41,133*
July	30,405	13,383	17,022	4,798	1,043	905	500*	366	5,602	7,566	11,424	744	1,264	1,200*	52,434*
Aug.	35,593	15,114	20,479	5,580	398	1,227	500*	544	5,668	7,438	11,798	779	1,732	1,200*	57,343*

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, and 2,439 in 1927. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 93 tons 1924, 6 tons 1925, 20 tons in 1926, and about ½ ton in 1927. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I" are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, 44 tons in 1926, and 84 tons in 1927. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands. This figure includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown immediately it becomes available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(*Long Tons*)

	United States[a]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (ac)	Italy	Russia (ce)	Australia (ed)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	236,977	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	342,378
1920	248,762	56,844	13,885	11,890	11,746	5,297	6,122	62	1,815	3,840	5,510	2,292	2,008	567	370,641
1921	179,678	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,562
1922	296,267	11,724	24,352	27,546	9,207	15,934	6,430	2,493	2,643	172	-3,807	1,778	589	567	395,885
1923	300,372	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	408,018
1924	317,747	-11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,685	-807	3,178	944	1,370	414,847
1925	381,815	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	516,493
1926	395,667	34,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	613,643
1926:															
April	33,416	3,275	4,121	1,781	1,615	1,868	865	402	505	71	93	335	130	193	53,670
May	28,705	6,773	2,519	1,848	1,239	1,010	705	200	468	186	241	225	60	192	44,371
June	23,795	5,894	2,196	1,655	1,188	1,465	1,070	983	636	269	215	303	123	103	39,895
July	34,266	6,768	2,352	2,202	1,552	1,447	800	132	702	295	480	292	121	115	51,524
August	26,081	7,327	2,457	2,110	1,888	1,284	796	655	1,275	303	594	336	90	151	45,347
September	35,675	3,843	1,774	2,029	1,355	1,922	819	472	1,241	283	429	317	91	138	55,388
October	28,110	3,082	3,376	2,423	1,865	2,396	645	585	1,004	301	2	360	100	121	49,370
November	37,673	9,247	2,719	3,007	1,548	3,380	832	568	916	194	-18	358	90	181	60,695
December	35,850	4,749	2,890	2,562	1,847	856	439	725	777	248	156	443	151	806	51,999
1927:															
January	41,815	10,192	3,284	2,481	1,936	1,227	672	803	929	296	192	316	139	100	64,382
February	25,886	7,692	3,263	3,103	2,620	1,902	601	907	460	502	152	336	146	210	47,780
March	32,752	9,049	2,050	3,475	3,760	1,578	852	784	780	454	86	385	137	127	56,269
April	44,627	7,875	2,810	2,393	1,509	2,181	781	1,972	762	448	58	230	177	218	65,541
May	33,736	2,896	2,006	3,380	2,519	1,084	918	887	694	626	-57	335	155	223	49,402
June	31,270	2,282	2,387	3,632	2,086	798	942	1,506	557	583	-17	243	164	183	45,616
July	35,719	1,116	2,384	2,899	2,104	1,505	1,007	415	900	429	66	227	177	236	49,184
August	31,001	3,463	2,795	3,119	2,013	1,970	1,274	386	650	604	-63	312	138	123	47,785
September	29,801	7,800	1,956	2,891	1,850	2,025	684	518	772	552	-33	451	155	272	49,694
October	27,671	5,888	3,479	4,202	1,790	1,966	1,021	1,075	908	465	156	401	153	363	49,538
November	36,123	1,687	3,661	4,209	1,916	1,575	1,167	1,312	836	749	298	474	246	317	54,570
December	28,082	309	4,696	3,108	2,302	2,710	1,462	1,453	1,242	784	-202	514	268	300	47,028
	398,483	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,492	636	4,224	2,055	2,672	627,789
1928:															
Jan.	37,120	1,921	1,764	2,485	2,290	1,361	760	995	802	589	52	261	335	376	51,111
Feb.	30,926	3,143	2,526	2,984	2,553	1,258	437	159	616	599	98	307	296	297	46,199
Mar.	36,970	3,179	1,902	3,521	2,989	1,707	763	1,468	918	816	95	351	497	398	55,574
April	35,686	—2,280	2,204	2,719	1,938	2,353	1,115	926	832	575	280	339	304	159	47,150
May	28,659	—5,323	3,210	2,944	2,180	2,306	1,095	744	655	746	209	485	220	213	38,343
June	25,143	—3,031	4,550	2,968	2,632	2,119	984	710	348	743	133	346	251	182	38,078
July	28,170	—1,374		3,387	2,692		1,599	660	591	895	395			384	
Aug.	28,497	48									316				

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—German, United Kingdom, and United States exports to Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. *United States imports of guayule are not included in this compilation; such imports amounted to 4,305 tons in 1926 and to 5,019 tons in 1927.

BOOK REVIEWS

PRACTICAL COLOR SIMPLIFIED. By William J. Miskella, M. E. Published by Finishing Research Laboratories, Inc., Chicago, Ill. 1928. 128 pp.

The author of this handbook was for five years design engineer of the Western Electric Company and for 15 years president of the Lamberson Japanning Company, said to be the world's largest and most diversified finishing plant, handling everything from tacks to automobiles. Chapters on color mixing, color pigments, and color testing are especially valuable. The book is illustrated with color plates.

TIME AND MOTION STUDY AND FORMULAS FOR WAGE INCENTIVES. By Stewart M. Lowry, Harold B. Maynard and G. J. Stegemerten. Published by the McGraw-Hill Book Company, New York City. 1927.

This volume offers a description of time and motion study developed into a practical working system that may be applied in any industry with the use of simple and inexpensive apparatus. The method of making a time study, the methods for constructing formulas from time-study data, and an explanation of how to organize and supervise time-study, formula and wage-payment work in any plant make up the book.

MOST EFFICIENT DRIVE IN INDUSTRY. Published by the Electric Machinery Manufacturing Company, Minneapolis, Minn. 1928. 56 pp.

Large in size and well illustrated, this book on the subject of synchronous motors is intended to fill a long standing need for a non-technical volume on this topic. The advantages of the synchronous motor in comparison with other types, the theory of its operation, and its development to present high efficiency are well covered, while the last half of the book is devoted to scores of applications. The rubber industry is among those receiving special attention in this section.

United States Imports of Guayule Rubber and Related Gums

(All quantities in Long Tons)

	Guayule		Balata		Jelutong		Gutta Percha	
	Tons	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars
1919	1,430	760,690	727	937,038	8,332	2,213,964	2,900	1,068,698
1920	758	345,985	1,064	1,260,043	5,672	2,068,501	3,183	1,520,309
1921	58	26,945	814	1,077,859	1,745	351,893	985	333,564
1922	127	57,040	812	978,765	2,335	403,812	818	281,012
1923	1,155	542,227	700	898,524	4,565	853,308	912	375,167
1924	1,356	536,392	464	568,456	6,165	1,237,100	1,408	463,610
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	1,603	629,284
1926	4,305	2,562,096	354	327,213	7,263	3,127,757	1,445	661,156
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,494	728,172
1928:								
Jan.	432	242,339	27	24,218	588	183,705	150	86,702
Feb.	489	281,295	33	32,165	403	142,621	312	215,085
Mar.	575	365,927	32	26,460	829	388,616	115	57,833
Apr.	512	312,131	47	32,924	592	174,970	68	27,627
May	452	283,414	—	——	679	226,064	100	42,762
June	424	220,081	9	6,799	293	91,152	28	12,374
July	191	100,342	123	46,747	373	113,295	81	27,344
Aug.	—	——	399	165,460	451	126,962	147	60,738

Reclaimed Rubber in the United States

(All Quantities in Long Tons—100% Basis)

Year	Production	Consumption Tons	Consumption % to Crude	Stocks*
1919	81,366	78,535	36.8	.....
1920	86,395	75,297	38.4	.....
1921	36,725	41,351	24.1	.....
1922	57,834	54,458	19.3	.....
1923	74,766	69,534	22.7	.....
1927:				
Jan.	16,526	12,374	39.3	25,903
Feb.	15,860	14,424	47.8	27,291
Mar.	16,788	13,528	37.4	27,124
Apr.	14,483	16,677	46.5	25,712
May	16,159	15,754	46.1	26,419
June	16,652	15,547	46.0	25,811
1928:				
Jan.	14,862	18,134	52.7	21,941
Feb.	15,291	16,808	49.9	20,848
Mar.	17,069	18,619	52.2	19,558
Apr.	15,393	17 355	52.9	19,283
May	18,945	18,201	48.8	18,137
June	18,781	16,328	43.4	18

Year	Production	Consumption Tons	Consumption % to Crude	Stocks*
1924	80,079	76,072	22.4	.....
1925	132,930	137,105	35.6	13,203
1926	180,582	164,500	45.9	28,218
1927	189,144	178,471	47.6	24,980
July	15,488	13,842	47.4	26,599
Aug.	15,109	15,836	47.3	25,157
Sept.	14,392	14,790	54.3	23,429
Oct.	16,127	17,292	64.5	22,176
Nov.	15,477	14,876	55.5	21,728
Dec.	16,083	13,431	52.7	24,980
July	17,278	17,173	45.9	17,305
Aug.	19,049	15,532	36.2	15,881
Sept.				
Oct.				
Nov.				
Dec.				

*Stocks on hand at the end of month or year. Exports of reclaimed rubber, not shown in this table, amounted to 8,540 tons in 1927.

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